Health and Welfare Canada
Santé et Bien-être social Canada

NATIVE FOODS AND NUTRITION

AN ILLUSTRATED
REFERENCE
RESOURCE

Canada

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NATIVE FOODS AND NUTRITION

AN ILLUSTRATED REFERENCE RESOURCE

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PREFACE

The Illustrated Reference Resource – Native Foods and Nutrition, brings together for the first time in Canada a comprehensive look at nutrition issues of special concern to Indian and Inuit people in light of traditional and changing food habits.

This Reference Resource is designed as an educational tool for community workers and educators working in a variety of settings to be used together with the Nutrient Bar Graphs for Native Foods, published by Medical Services, 1984. It should also be of interest to other health professionals and educators who wish to learn more about native food habits.

The section on the proposed Community Food Guide should stimulate a dialogue among health professionals and native leaders across Canada to consider the best use of locally available foods.

The Illustrated Reference Resource, Native Foods and Nutrition is intended to be a working document. As more information becomes available on a regional basis, and its usefulness as an educational tool is evaluated, it will be revised and updated.

ACKNOWLEDGMENTS

The Nutrient Bar Graphs and Reference Resource – Native Foods and Nutrition represent the combined efforts of many people across Canada. The Medical Services Branch is indebted to the Community Health Representatives and Regional Nutritionists for their assistance in determining current food habits and foods most commonly used in different regions and to Pam Verdier, Harriet Kuhnlein and Helen Hooper for providing nutrient values for native foods not readily available in the literature.

Special thanks to Bernard Assiniwi for his scientific expertise in reviewing the graphics and to Carmen Maracle for his assistance in suggesting appropriate graphics for the Nutrient Bar Graphs. We owe a special thanks to Ernie Benedict and Carol Prince for helping us to place this information in perspective and to Nancy Turner for her advice on native plants. Finally the Medical Services Branch expresses its appreciation to Judith Lawn for compiling the data and preparing the manuscript, and to Dr. Jean Steckle for her leadership and foresight in seeing this project become a reality.

(Photo from the Photo Collection, National Museum of Man, Ottawa)

PART ONE
Educational Objectives

Educational Objectives

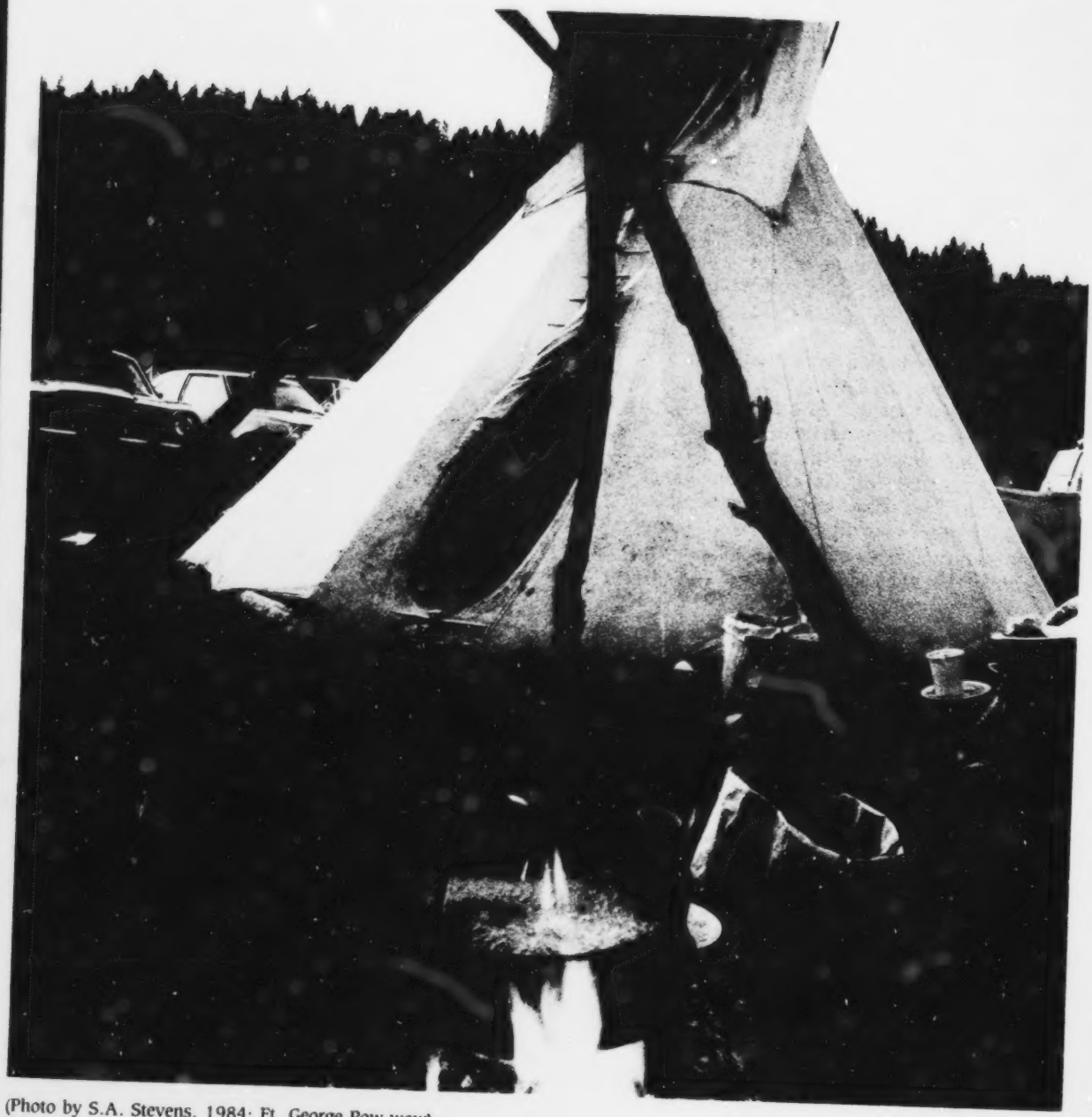
The Illustrated Reference Resource, Native Foods and Nutrition will assist the educator to more effectively use the Nutrient Bar Graphs. Together they are designed to accomplish the following objectives:

(a) To promote a greater awareness of the value of native foods used in different areas of Canada.

(b) To promote a greater understanding of the contribution of native foods to good nutrition and health.

(c) To provide a better understanding of the effect of changing food habits on nutrition and health.

(d) To help individuals and communities choose native foods wisely, substitute non-traditional foods of similar nutritional value at a reasonable cost and include a greater variety of foods in the diet.



(Photo by S.A. Stevens, 1984: Ft. George Pow-wow)

PART TWO
Traditional Food Habits

Traditional Food Habits

For thousands of years the Indian and Inuit in Canada lived from the land, rivers, lakes and the sea. Survival in this rugged, rich land was a measure of supreme skill in hunting and fishing, knowledge of native plants and appropriate food preservation techniques.

The traditional diet consisted mainly of meat or fish supplemented by berries, wild greens, roots, bulbs, nuts and seeds. As long as supplies were plentiful, people were able to maintain a healthy diet. The native people learned, through experience, to select those foods in proper amounts to supply the body with the nutrients it needs. Respect for the land, and the food it provided, led to the wise use of animals, fish and plants. Very little was wasted. Food was considered sacred.

Wild game – moose, deer, elk, buffalo and caribou – were plentiful in most parts of Canada, as were birds and smaller animals such as rabbit, beaver and muskrat. Fish and game were usually smoked or dried for the winter months. The oil or fat from birds, animals and fish was essential for people living in a cold climate. Fat was either removed by rendering, or extracted through fermentation and later used in cooking and baking or for light. In the Arctic, where fuel was scarce, fish and seal were eaten raw or frozen. Berries, bulbs and roots were air-dried, often mixed with oil or fat, and sometimes dry meat or fish to form pemmican. This was stored in cedar casks, underground pits, birch bark containers or animal stomachs away from the air and light. Seeds and nuts were collected, dried and stored for winter use. Nuts, like hazelnuts, were crushed and added to meat stock for a delicious soup. Corn was ground into flour and mixed with animal or vegetable fat to prepare the traditional Indian bread, "bannock". Berries, honey and the sap of birch or maple were used as sweeteners.

(Photo from Photography Division, National Archives of Canada)

Labrador tea and other herbal teas (e.g., salmonberry, raspberry) made from the leaves, stems or bark of shrubs were the traditional beverage of most native people. Many of these herbal teas are still used today.

On the west coast, black tree lichen and seaweed were dried. Dried herring eggs on kelp was a favorite food of some British Columbian coastal groups. Smoked salmon and salmon fish eggs were often served with bannock for breakfast. A great variety of fish, game and vegetable soups were made, using whatever foods were available in the area.

Bernard Assiniwi, in his book "Indian Recipes", provides a wonderful collection of traditional and new recipes from across Canada. Among the recipes submitted is one for the famous Indian "Succotash", a complete protein meal made by boiling corn and beans together.

Very sophisticated cooking techniques were developed, the method varying according to the region and foods available. In some regions, vegetables were steamed in underground pits lined with rocks. In others, fish was wrapped in clay and baked in the sand.

In some areas of Canada these skills and methods are still known and practised especially for festive occasions. The tempting aroma of a steaming soup kettle with hearty chunks of salmon, delicately flavoured with wild onions, mushrooms and yellow lily roots might still be served on the West coast. And "Indian Ice Cream," a light dessert made by whipping soapberries, is still prepared in some communities.

The menu would vary from coast to coast, by season, and with different foods cherished by different Indian and Inuit tribes.

Travel to the Arctic, and you might be treated to frozen raw seal with a texture and flavour not unlike frozen sherbet. Drop in on a family in the northern plains, and you might be just in time for a delicious buffalo steak served with bannock and fresh Saskatoon berries. Or if your travels take you to the Atlantic coast, your meal might include salt cod, smoked eel soup, or clam chowder.

American Indians took great pride in their agricultural achievements long before the arrival of the Europeans. Their plant breeding techniques were among the most advanced in the world. South of the Great Lakes, Indians cultivated at least 79 different varieties of plants, including seeds (e.g., sunflower), fruit trees (e.g., pears), vegetables (e.g., tomatoes, potatoes, squash), fibre (e.g., cotton) and plants for medicinal or narcotic use. More than 86 varieties of corn were cultivated. Twenty-one varieties were grown in the north.

(Photo from the Photo Collection, National Museum of Man, Ottawa)

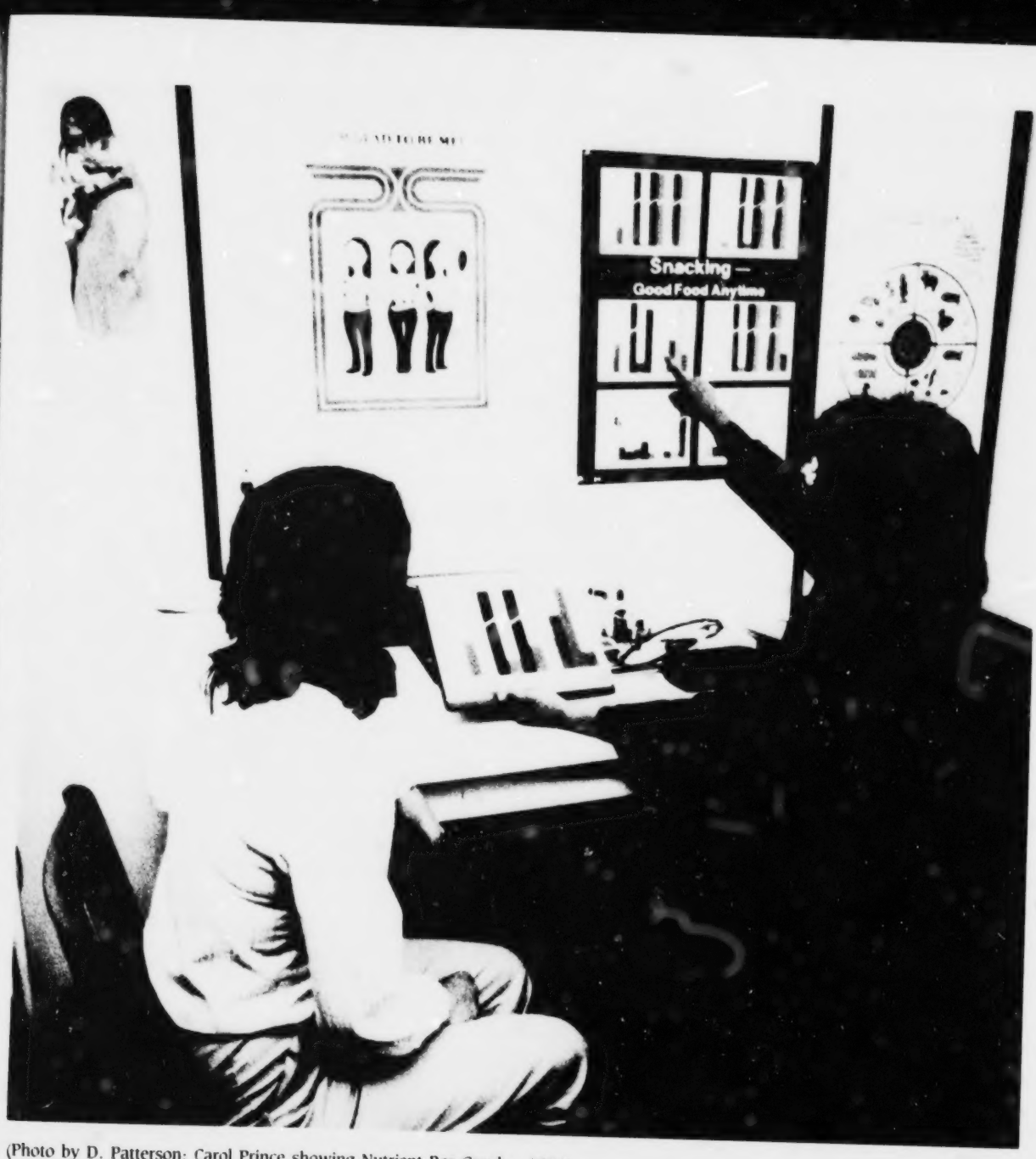
The American Indians taught the Europeans to grow or use more than 29 different vegetables which were unknown in Europe at that time (e.g., tomatoes, potatoes, squash, cucumbers, corn and beans).

As trading increased between Indian and Inuit tribes, and Europeans arrived in Canada, new foods were added – sugar, wheat flour, pork, cattle and milk.

Today, many of the traditional North American foods are less plentiful. With the growth of large urban centres and rural settlements, nomadic lifestyles have been abandoned. People must travel further to hunt and fish. In some areas, the water has been contaminated with pollutants, such as mercury, forcing people to look for alternatives to the traditional fish diet.

Food habits have also changed in response to changing work habits, the availability of refrigeration and freezer storage and the growth of modern air transportation. Further, a decrease in the traditional sources of food and the increased availability of store foods have also changed food habits.

While modern technology has created many time-saving benefits, it has also introduced soft drinks, candy bars and high-energy, low-nutrient snack foods. For some, the resulting change has led to careless food habits and a number of nutritional and dental problems.



(Photo by D. Patterson: Carol Prince showing Nutrient Bar Graphs, 1984)

PART THREE
Understanding the Nutrient Bar Graphs

Interpreting The Nutrient Bar Graphs

The Nutrient Bar Graph series presents a colourful nutrition profile for 60 foods, representing regional food habits. Further, the nutrient value of 170 foods is included in Appendix K.

The Nutrient Bar Graphs are organized into four categories of common foods: Meats; Fish; Vegetables/Fruits; Cereals/Fats. A list of the native foods included in the Nutrient Bar Graph series is provided in Appendix C.

The Nutrient Bar Graphs are like windows looking into a food. At a glance you can tell whether a serving of a food is an important source of energy and each of the 10 selected nutrients needed for good health.

Across the bottom (horizontal axis) of each Nutrient Bar Graph, you will find listed energy (kilojoules) and 10 essential nutrients, each nutrient represented by a bar of a different colour. The left-hand side of the bar graph (vertical axis) gives the percentage of the Recommended Nutrient Intake (RNI) for a girl aged 13 to 15 years, weighing 48 kilograms. The height of each bar indicates the percentage contribution made by one serving of this food to the RNI of a teenaged girl. If a food contributes more than 33 per cent of the amount recommended for each nutrient, this is represented by a broken bar. The numeral at the base of the bar gives the actual percentage of daily requirement provided.

Source of Nutrient Data

Most of the nutrient values for the foods included in the Nutrient Bar Graphs series and other foods included in Appendix K were obtained from The Canadian Nutrient File provided by the Bureau of Nutritional Sciences, Health and Welfare, Canada. This list is constantly being extended to include foods commonly used by Canadians. In years to come more values will be determined. Unfortunately, no nutrient values are available for a number of traditional meats such as buffalo, elk, mountain goat, or their organ meats. Since organ meats from wild game have been an important part of the diet and are known to be a rich source of nutrients, their use should be encouraged. In order to promote discussion and encourage the use of these important foods, the nutrient value of beef kidney and tongue have been included in the Table of Nutrient Values of Selected Foods Commonly Used by Indian and Inuit. (Appendix K). Appendix B provides a complete list of the sources of nutrient data.

Whenever possible, nutrient values were calculated for cooked rather than raw meats or fish (except seal, which is preferred raw by some groups in the Eastern Arctic).

For those meats or fish, where values are provided for the raw form, one can assume that on cooking, there will be some loss of thiamin (20 to 50%) with higher losses at high cooking temperatures. Since both thiamin and niacin are soluble in the cooking water, it is important to use the cooking liquid or meat drippings. Cooking generally results in some loss of moisture, and depending on the cooking method, some loss of fat.

Smoking of meat or fish removes moisture and enhances preservation. Smoked products can also be frozen or canned for longer storage.

Nutrient Density

The nutritional quality of food is best judged by the nutrients provided per unit of energy (kilojoule/calorie). For example, goose contributes a significant amount of key nutrients. But, compared to moose, it also contributes almost twice the number of calories. Therefore, its nutrient density is half that of moose.

Key Nutrients

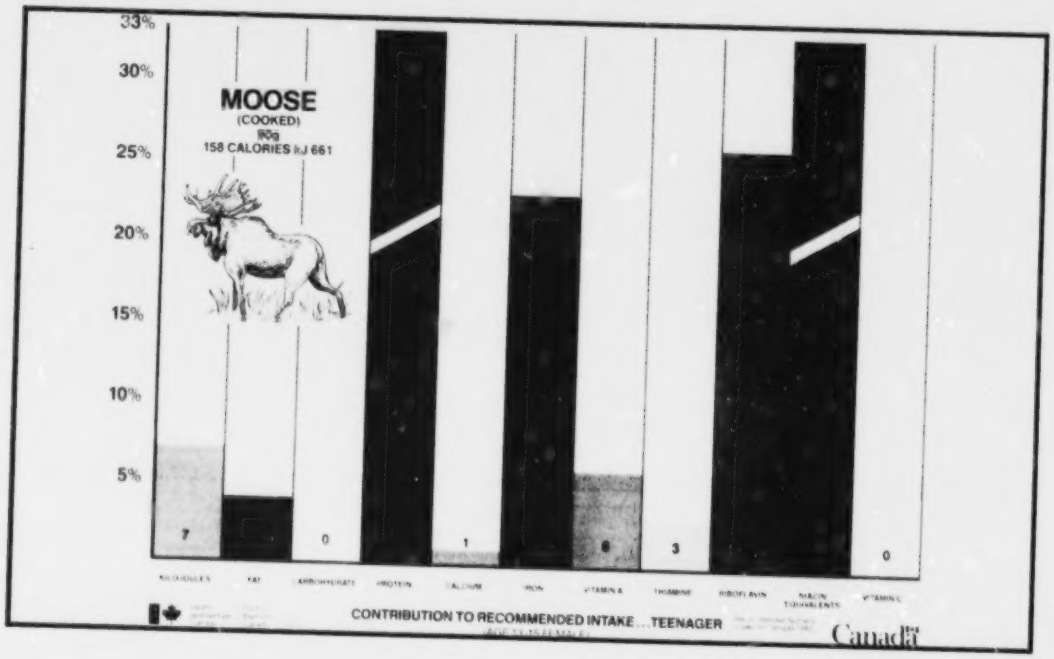
1. The percentage contribution of a food to the recommended daily intake of essential nutrient depends on the number and size of servings eaten.

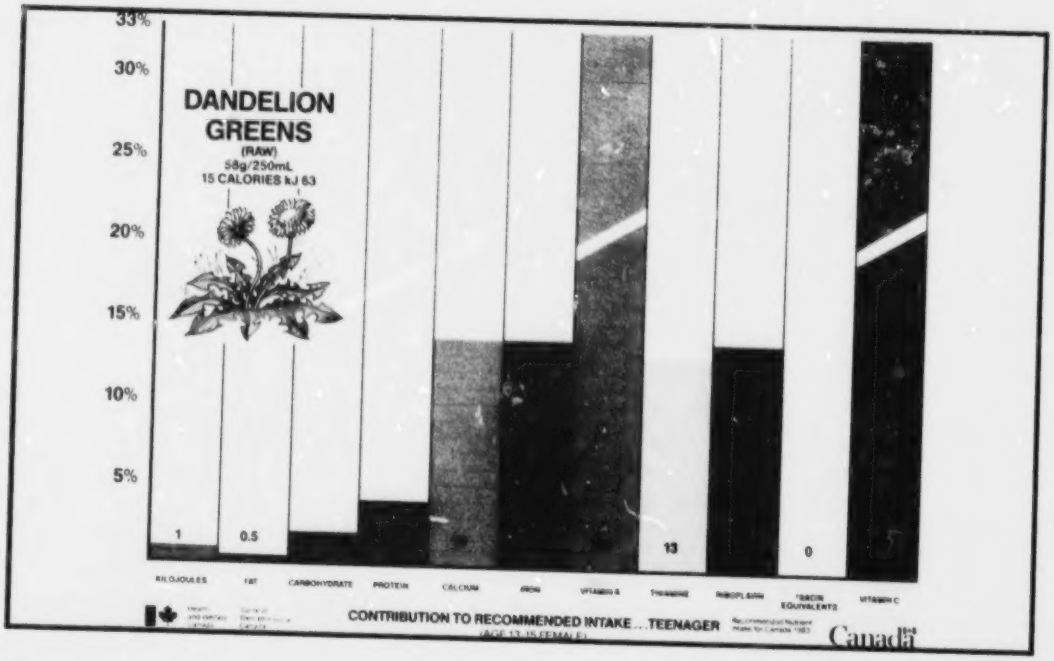
The Nutrient Bar Graphs illustrate that, based on the average eating pattern of Canadians of all age groups, certain groups of foods contain similar key nutrients. For example, game birds and fish may be grouped together since they provide similar amounts of protein, riboflavin and niacin.

Compare the nutrient graphs for one serving (90 grams) of cooked moose with one cup of raw dandelion greens. It becomes apparent that cooked moose makes an important contribution to the recommended intake of protein, iron and niacin while dandelion greens make a significant contribution to the need for vitamin A, vitamin C and calcium.

2. Since most people eat 3 to 5 servings per day of bread, bannock and cereals, the key nutrients in this group are carbohydrate, thiamin, riboflavin, niacin and iron.

Bar Graphs for Moose and Dandelion Greens





(Illustrations from Medical Services Branch, Health and Welfare Canada)

Recommended Nutrient Intake

The Recommended Nutrient Intakes (RNI) for Canadians were developed by an expert Committee of Canadian Nutritionists. The Committee evaluated the available evidence on the human requirements for nutrients and recommended certain levels of intake of essential nutrients for Canadians based on their age, sex, body size and activity. Recommendations are provided in the booklet "Recommended Nutrient Intakes for Canadians, 1983" published by Health and Welfare Canada. A summary table of these recommendations updated in 1984 is provided in Appendix G.

The recommendations represent levels of intake needed "to maintain health in already healthy individuals"(1). The Recommended Nutrient Intake (RNI) is considered to be that level of nutrient which is high enough to meet the needs of almost all individuals within that group. It does not mean that, if a person's diet provides less than the recommended amount of a specific nutrient, the individual is not meeting his/her requirement, but the lower the intake in relation to the RNI, the greater the risk that this will be the case.

The Nutrient Bar Graphs are based on the Recommended Nutrient Intake (RNI) for a girl aged 13 to 15 years weighing 48 kilograms. Since the need for essential nutrients is highest during this stage of life, any food which makes a significant contribution to the nutrient requirement of a 13 to 15-year-old menstruating girl will also be significant for other age groups.

(Photo from the Photo Section, Department of Indian and Northern Affairs, Ottawa)

The average daily RNI for a teenage girl, age 13 to 15 (weighing 48 kilograms) is as follows:

Calories	2200	
kilojoules	9204	
Fat	85	grams
Carbohydrate	275	grams
Protein	43	grams
Calcium	800	milligrams
Iron	13	milligrams
Vitamin A	800	Retinol Equivalents (RE)
Thiamin	.88	milligrams
Riboflavin	1.1	milligrams
Niacin	15.8	Niacin Equivalent (NE)
Vitamin C	45	milligrams

(Illustration from Medical Services Branch, Health and Welfare Canada)

PART FOUR
Nutrient Value of Native Foods

Achieving Good Nutrition

Traditional Diet

Henry Isluanik spoke of the food habits of the Inuit at the Inuit Nutrition Workshop in October 1977. He explained,

> "Amongst the land people and the sea people there were certain foods that were considered particularly good for good health. For the land people it was caribou meat with marrow, clarified caribou fat and caribou liver. Among the sea people, seal meat with fat was considered good, also char, fresh seal liver and meat."

Modern Science of Nutrition

Today scientists have developed methods of determining what nutrients food contains to make it good and how much is needed for good health. Already it is known that the body needs more than 50 different nutrients in specific amounts for good health. Essential nutrients are categorized as: protein, fat, carbohydrate, vitamins, minerals and water. Other nutrients have been identified in food, but their value to the body is not yet known.

(Photo from the Photo Collection, National Museum of Man, Ottawa)

Fats, Carbohydrates and Protein/Energy Balance

Just as plants need energy from the sun to grow, the body needs energy to carry out its activities. This energy comes from the food we eat – from three essential nutrients – fats, carbohydrates and protein.

If the diet provides more energy than the body needs, this excess energy is stored as fat. If the diet provides less energy than needed, weight loss will result. Maintaining an "energy balance" is essential for health and weight control.

The energy in food is measured in kilojoules (calories). The amount of energy required by an individual will vary according to age, sex, level of physical activity and body size. For example, a girl aged 13 to 15 years weighing 48 kilograms would need approximately 9205 kilojoules (2200 calories).* A man aged 19 to 24, weighing 71 kilograms would need 12400 kilojoules (3000 calories). The need for energy begins to decline after age 35, levelling off at age 65. A woman aged 65 would need approximately 7531 kilojoules (1800 calories). These levels are based on a sedentary lifestyle.

Nutrient Balance

Energy balance, exercise and weight control are only one side of the coin. The other, which is equally important, is a balance of the nutrients necessary for good health.

Each nutrient has a specific function (Table 1). While some nutrients may be found in many foods, some foods are better sources of certain nutrients. Most nutrients depend on the presence of others to perform their function. For example, vitamin D aids in the intestinal absorption of calcium, while both calcium and phosphorus are needed for the formation and maintenance of bones and teeth. This interdependence of nutrients partly explains why foods containing many nutrients are a wiser choice than vitamin or mineral supplements.

(Photo by S.A. Stevens, Mitchell & Farmer Dance Studios, Oshewegan, Ontario)

* Note: 1 kilocalorie = 4.2 kilojoules

(Photo from the Photo Section, Department of Indian and Northern Affairs, Ottawa)

Nutrient needs vary throughout the life cycle. For example, the amount of calcium recommended daily is highest at age 12 which corresponds with the body's peak growth period; similarily during pregnancy and breastfeeding requirements increase.

In describing the value of the nutrients available in native foods, terms are used in this publication to help define the quantity available to meet the recommended nutrient intake (RNI) for Canadians (Appendix G).

A "very good" source provides 50% or more of the RNI

A "good" source provides 20-50% of the RNI

A "fair" source provides at least 10% of the RNI

Table 1

Role of Eleven Nutrients Essential for Good Health

NUTRIENT	ROLE
FAT	• supplies energy • carries fat-soluble vitamins A, D, E and K
PROTEIN	• builds and repairs body tissues • builds antibodies to fight infection
CARBOHYDRATE	• supplies energy • includes fibre • helps to utilize fats
CALCIUM	• helps to build bones and teeth and keep them strong • promotes healthy nervous system and normal blood clotting
IRON	• essential for transport of oxygen and carbon dioxide in the body
VITAMIN C	• maintains healthy teeth and gums • maintains strong blood vessel walls • assists in absorption of iron
VITAMIN A	• promotes normal bone and tooth development • promotes good night vision • maintains the health of the skin and membranes • helps fight infection
VITAMIN D	• prevents rickets • promotes calcium/phosphorous utilization in bone growth and repair and tooth formation
THIAMIN	• releases energy from carbohydrate • aids normal growth and appetite
RIBOFLAVIN	• maintains healthy skin and eyes • maintains a normal nervous system • releases energy to body cells during metabolism
NIACIN	• Promotes normal growth and development • maintains a normal nervous system and gastro-intestinal tract

Meat

Nutritional Value of Game

Large game (caribou, moose, seal, buffalo), small animals (rabbit, muskrat), and birds (duck, goose) were the mainstay of the diet of many native groups and the principal source of protein, fat, iron, vitamin A, thiamin, riboflavin and niacin.

Compared to modern, ration-fed animals, such as beef or pork, or their products such as prepared luncheon meats, and bologna, most wild game is approximately 50% lower in energy (calorie/kilojoule) and 50% higher in other nutrients. (Appendix F).

Small amounts of vitamin C are found in liver, bear meat, seal and ptarmigan.

The organ meats (liver, kidney and heart), widely enjoyed by native people, are very good sources of iron, vitamin A and riboflavin.

It is said that the liver was eaten immediately after the animal was slaughtered and this gave the hunter the energy he needed to carry the animal back to camp. Today, scientists confirm the presence of some glycogen in the liver, a carbohydrate providing energy.

Muktuk, the tissue lying under the hide of whales, was enjoyed by a number of Arctic coastal groups. It is a rich source of fat, and also contributes calcium, vitamin A and thiamin.

Animal blood, a very good source of protein and iron, was traditionally used for gravy, poured into animal intestines to make sausage, or stored in caribou stomachs where it was allowed to ferment.

Bone marrow was eaten raw or added to soups and stews. In some northern communities, the marrow was placed in a cleaned caribou stomach, allowed to melt or ferment in the sun and used as a dip for meat. Marrow continues to be an important ingredient in soups and stews. It provides flavour, fat and small amounts of iron, vitamin A, thiamin, riboflavin and niacin.

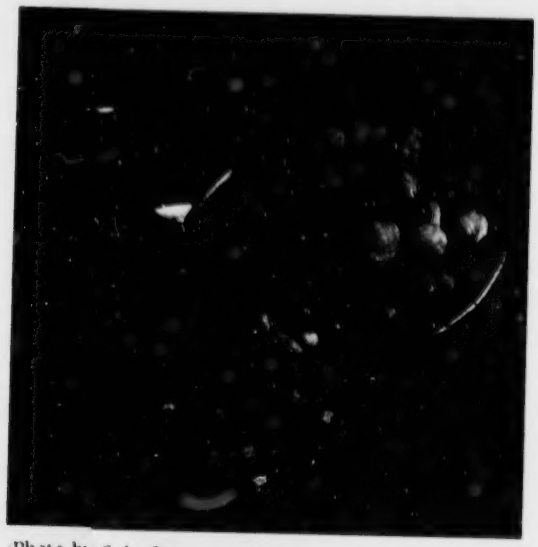
Some groups mixed the stomach contents of caribou with oil made from seal or caribou. The contents – lichen and moss – are a good source of carbohydrate, protein, calcium, vitamin A, thiamin, riboflavin and niacin. Today there is some concern about the radioactive content of lichen. If this is an important part of the diet, more research may be necessary before it can be recommended as a source of food.

Animal intestines were scrubbed clean, cooked and served in small amounts along with meat, dried and used as a tasty snack, or used as a casing for sausage. They were not only a rich source of fat, but a good source of iron, riboflavin, niacin and calcium.

Substitutions

As more people rely less on wild game and fish and turn to store-bought meats, fish and poultry, it is important to recognize that many of these products are much higher in fat and consequently energy, and lower in other key nutrients. This is particularly true of sausages, wieners and luncheon meats.

To keep the energy in balance lean meat, poultry, organ meats or fish such as cod, salmon or haddock are used. This also increases nutrient density.



(Photo by S.A. Stevens, 1984)

Organ meats like chicken livers, beef or pork liver, kidney, tongue and blood sausage are very nutritious and inexpensive substitutes for less plentiful wild game. They can be used in the diet once a week.

Dry beans and peas are another alternate source for the protein and other nutrients in meat or fish. Both make delicious soups or main dishes.

Fish

Many varieties of fish and shellfish continue to be an important part of the diet in many native communities.

On the Atlantic coast species such as eel, cod, clams, haddock and Atlantic salmon are still enjoyed following traditions that are centuries old.

In central Canada lake trout, pickerel, pike, whitefish and smelts are the principal species eaten.

Arctic Char is an important mainstay of the Arctic diet. Salmon, ooligan and shellfish such as crabs and oysters are the principal fish eaten by the people along the coast of British Columbia.

The Nutrient Bar Graphs illustrate that fish and shellfish are an important source of protein and niacin.

Compared to meat, fish is usually low in fat. The fat content ranges from as little as 1 per cent in dried salted cod to 15 per cent in fish such as eel or mackerel. Some of the fattier fish are a good source of vitamin A. For example, a serving of eel (90g.) contains 16 g of fat and 435 RE of vitamin A compared with a serving of herring (90g) which provides 14 g of fat but only 47 RE of vitamin A (See p. 94).

(Photo of Nuxalk Food and Nutrition Project, Bella Coola, 1984. Photo by J. Steckley)

Fish is also a wise choice in a prudent diet for lowering cholesterol.

Most fish, except certain species of shellfish such as Black Sea Prunes or Oysters, are low in iron.

Fish liver and fish eggs are also enjoyed by many people. Fish liver is a valuable source of vitamins A and D, riboflavin and calcium. Fish eggs are often lightly fried or added to bannock, providing added protein, calcium and iron. Dried herring eggs on kelp supplements the high protein, calcium, iron and thiamin of herring eggs with the fat, protein, vitamin A, calcium, iron, riboflavin and niacin of kelp, making a very nutritious combination.

Birds and Eggs

While less plentiful than in the past, wild birds such as ducks and geese are still an important food particularly in northern Canada and across the prairies.

Wild birds are an excellent source of protein. With the exception of geese, wild game birds are generally low in fat. They contain more iron than domestic poultry and they are a very good source of niacin.

Wild duck eggs are very similar in nutrient value to chicken's eggs although they would appear to be a better source of iron and riboflavin, but lower in vitamin A (See table of Nutrient Values).

Note: *The calcium values provided for ptarmigan appear to be unusually high. Since no information is available on the sample preparation, it would be more reasonable to assume that ptarmigan has a calcium content similar to pheasant or goose.*

Wild Greens, Berries, Vegetables/Fruits

During the last century, many native plants have disappeared while others (e.g., dandelion) have been introduced from other countries. Traditionally people gathered wild greens, seaweed, roots and bulbs, berries and cambium (inner bark) which provided much of the needed vitamins and minerals.

The use of native plants varied from region to region as did the common names. For example, in some regions young leaves of the Docks (Rumex) (sour dock, curly dock and yellow) were called "Indian Rhubarb". However, in parts of British Columbia, this term was used to describe "Cow Parsnip" of which the peeled stalk, not the leaves, were eaten. British Columbia coastal groups referred to Western Dock (Rumex Occidentales) as "Indian Rhubarb", using the stem and leaves.

Note: *The nutrient value of sour, curly and yellow dock and sheep sorrel is very similar. Therefore the Nutrient Bar Graph for Dock (Rumex sp.) may be used to describe any of these plants.*

Of the berries available across Canada, cranberries (low bush, high bush and bog) were among the most plentiful. Since complete nutrient values were only available for bog cranberries, this species was used for the bar graph. However, high bush cranberries, which are still available in many parts of Canada, are a much richer source of vitamins C and A. (See Table of Nutrient Values)

(Photo from Audio-Visual Services, Health and Welfare Canada)

Nutritional Value of Vegetables/Fruits

The nutrient bar graph for vegetables and fruit illustrates that these foods provide carbohydrate and are a major source of vitamin A, vitamin C, thiamin and iron.

Wild greens and berries are generally higher in vitamins and minerals than cultivated plants.

The dark green leafy vegetables (e.g., dock, lamb's quarters, fireweed) are very good sources of vitamin A, and good sources of calcium and iron. Raw greens (e.g., fireweed) and berries (e.g., currants) are a very good source of vitamin C.

Fruits and vegetables (especially raw) also supply fibre to the diet. Black tree lichen, which was collected by a number of Indian groups, contained a carbohydrate which swelled on contact with liquid giving a sensation of fullness in the stomach. This property made lichen an invaluable food in times of scarcity and also a useful ingredient for thickening soups. Black tree lichen is a particularly rich source of iron and a good source of calcium.

Seaweed (laver), an important coastal food, deserves special mention from a nutritional point of view. Seaweeds were eaten fresh as vegetables, or sun dried. Algae (dulse and laver) may be eaten fresh and raw in salads, cooked as a vegetable, added to stews, soups or casseroles or stir-fried. As a group, they are high in energy, a very good source of protein, calcium, iron, vitamin A, thiamin, riboflavin, niacin and a fair source of vitamin C.

Many of the wild greens and berries are still widely available and could be frozen or dried for winter use. Wild clover roots and silverweed roots were universally used on the West Coast and are still found in plentiful supply. A list of wild greens, fruits and nuts with traditional methods of cooking and preservation and some new ideas for their use is included in Appendices D, E and F. Skilled herbalists knowledgeable in their field can also be consulted.

Substitutions

Today it is possible to find fresh, canned and frozen fruits and vegetables which are both nutritious and reasonably priced. Potatoes, cabbage, turnip and canned tomatoes are good sources of vitamin C. Green leafy vegetables, if purchased in season, can be a very good, inexpensive source of vitamin A and iron. Vitaminized apple juice is a very good and inexpensive source of vitamin C.

Alfalfa or bean sprouts, which may be easily grown indoors and added to salads or soups, are another inexpensive and good source of vitamin C.

Toxic Effects of Plants

Through experience, native people learned to avoid or moderate their use of certain plants or parts of plants. For example, the stem of the curly dock may contain high amounts of tannic acid; the hairs on the seeds of rose hips will irritate the intestinal tract and large amounts of Labrador Tea may cause drowsiness. Many of these plants were used for medicinal purposes by the skilled herbalist.

Herbalists were experts at differentiating between safe and harmful plants which, to the novice, would appear similar. For example, the rhizomes (new shoots) of the fiddlehead (ostrich) fern (Matteucea struthiopteris) are edible but could be confused with the toxic bracken fern. The novice would need to learn to recognize the saw-toothed leaf of the ostrich fern with its slightly alternating branches and avoid rhizomes over six inches in height, which may have a toxic effect.

Nancy Turner, in her book "Wild Green Vegetables of Canada", lists a number of natural chemicals found in plants which may cause problems if consumed in large amounts: oxalic acid, nitrates, tannins, saponins, cyanogenic glucosides. These compounds are found in most wild and cultivated plants but the amount varies from plant to plant and in the different parts of the plant. For example, sheep sorrel draws its pleasantly sour taste from the oxalic acid it contains. However, since oxalic acid may be toxic if consumed in large quantities, it is wise to use sheep sorrel in moderation as a flavouring or "pot-herb" in soups or sauces. Rhubarb is another typical example of the toxicity of certain parts of a plant. The stalks of the rhubarb plant are safe while the leaves should never be eaten as they contain toxic amounts of oxalic acid.

Contaminated Areas

For those interested in picking wild plants today, there is a further precaution to keep in mind. One should never collect wild plants, especially roots and young shoots, in areas where the water is polluted by sewage or industrial waste or along roadsides which may have been sprayed with potent weed killers.

Bannock, Breads and Cereals

Nutritional Value of Bannock, Breads and Cereal

The nutrient bar graphs for bannock, oatmeal porridge and enriched macaroni demonstrate that these foods, especially whole grain and enriched cereal products, are important sources of carbohydrate, thiamin, riboflavin, niacin and iron. In fact, it is difficult to meet the Recommended Nutrient Intakes for Canadians for iron and thiamin without these foods.

Note: *The nutrient values for bannock are calculated from a recipe containing all purpose flour, salt, baking powder, lard and water (Northern Cookbook, p. 192).*

Bannock is still a favourite food among many Indian and Inuit groups but in many areas lard has replaced the traditional animal fat. Except for fibre one serving of bannock compares favourably with the nutritional value of enriched white bread. Its nutritional value could be further improved by using margarine to replace all or part of the lard, by using reconstituted skim powder for the liquid, and calcium enriched whole wheat flour, and by adding fish eggs or berries.

(Photo by S.A. Stevens, 1984)

Oatmeal and other cooked or ready-to-eat whole grain cereals (e.g. shredded wheat) are more nutritious (more fibre, trace minerals and B vitamins) and less expensive than many of the pre-sweetened cereals.

Enriched macaroni and other pasta products are also an important and inexpensive source of carbohydrate, iron and thiamin. They are a nutritious addition to soups and stews as well as an excellent base for casseroles.

Fats and Oils

Traditional Use of Fats in the Diet

Seal fat and the fat from animals (bear, moose), birds (goose) and fish (mackerel, ooligan), cereals (corn), seeds (sunflower) and nuts were the traditional sources of fat in the diet.

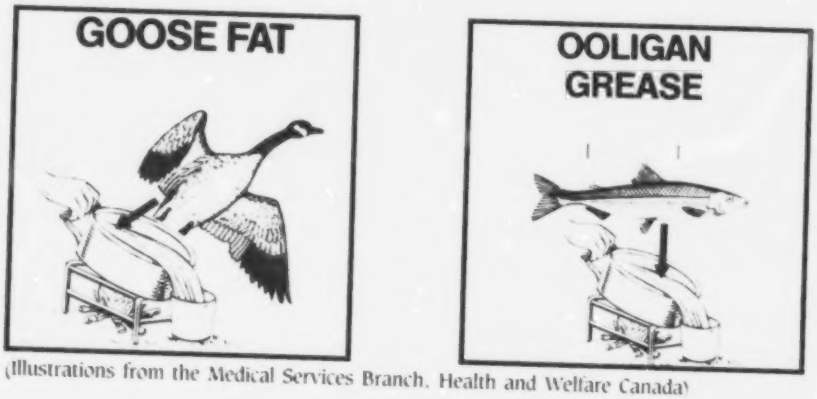
Fats were treasured for their flavour (as a dip or spread). They were widely used in baking (bannock), cooking (pan frying of meat, fish, roots and bulbs) and in preserving food (to store berries and dry meat, as a basis for pemmican).

Nutritional Value of Fats and Oils

Fats and oils are a concentrated source of energy (1 gram of fat yields 37 kilojoules compared to 16 kilojoules per gram for carbohydrate and protein). Traditionally, fat was the most important source of energy for Canada's native people. Some fats are an important source of the fat soluble vitamins – vitamins A, D, E and K and a source of essential fatty acids.

Changes in Fat Consumption

In many communities, lard has replaced natural fats for cooking and baking. Unfortunately, lard does not contain any of the other nutrients present in the traditional fats. For example, ooligan grease contains significant amounts of vitamin A, traces of thiamine, riboflavin and niacin and a small amount of calcium. Recent analysis of seal fat (the fat immediately under the skin) shows a surprising amount of thiamin, riboflavin and vitamin C, as well as a small amount of calcium. If seal fat is eaten in sufficient quantity, it would make an important contribution of these nutrients in the diet.



(Illustrations from the Medical Services Branch, Health and Welfare Canada)

Choosing a substitute for traditional fats involves a number of considerations, including flavour, cost and shelf life (particularly if refrigeration facilities are unavailable).

Lard has the advantage of a longer shelf life than butter but contains no vitamin A. It can be stored at room temperature and is much less expensive than either butter or margarine. If butter or margarine were used to replace traditional fats, rather than lard, they would be a valuable source of vitamin A. When lard is used, other sources of vitamin A are required regularly in the diet.

While for some, margarine may not equal butter in flavour, it is generally less expensive. Nutritionally margarine has the added advantage of being a good source of polyunsaturated fats (if the label declares the percentage of polyunsaturated fat). Vegetable oils and fish oils are both good sources of polyunsaturated fatty acids.

(Guest Lecturer: An Elder speaks on gardening in Norway House, Manitoba, 1982)

PART FIVE
Nutrition Issues of Special Concern and Sources of Nutrients Lacking in the Diet

Obesity

Incidence among Indians and Inuit

Traditionally obesity was related to opulence and power. Today, obesity is a major health problem in North America and is associated with an increase in the incidence of diabetes and heart disease. The Nutrition Canada survey, conducted in 1972, found a high prevalence of obesity among Indian and Inuit women, especially over age 40, in spite of an energy intake below the national population. The percentage of women between age 40 and 54 considered at high risk was approximately double the national population.(2)

Cause

Obesity results from an energy imbalance, that is, when the energy consumed is more than the energy required for activity.

A lack of regular exercise, combined with a diet high in energy, is believed to be the major cause.

It is unlikely that obesity or overweight was a serious problem for the early native people. The sheer challenge of getting enough food demanded a tremendous amount of physical energy and overeating was a luxury in which few could indulge. Also a nomadic lifestyle provided an opportunity to gather and use a wide variety of foods of a high nutrient density.

Traditionally, Indian and Inuit people used fat sparingly. There was very little hidden fat since wild game was so lean and the diet contained very few carbohydrate foods.

The increased use of store-bought meats such as bologna or meats with fat, the increased use of "high calorie – low nutrient foods" such as sugar and soft drinks and alcohol, may partly explain the greater incidence of obesity, as well as the decline in activity level.

Role of Nutrition in the Prevention and Treatment of Obesity

Today, Canadians are more conscious of the risks associated with obesity and many Indian and Inuit communities have become actively involved in weight control clinics which emphasize a well-balanced diet and regular exercise.

A successful weight-reducing plan usually involves certain permanent changes in food habits and lifestyle if weight loss is to be maintained. Learning to eat a variety of foods from each of the groups in Canada's Food Guide or from the proposed Community Food Guide suggested in Part Six, choosing lean meats, poultry or fish and avoiding excessive use of fats, sugar and alcohol will ensure that nutrient needs are met at the appropriate energy level. A well-balanced diet, combined with sufficient physical activity, is essential to prevent obesity and maintain optimum health.

Diabetes

Incidence among Indian and Inuit

The growing incidence of diabetes among Indian and Inuit, especially among adults, is a major health concern.[3] [4]

A recent theory suggests that "thrifty genes" may explain the high incidence of diabetes among native people.(5) For thousands of years survival depended on the ability to get through periods of famine. Under such conditions the body's ability to rapidly store fat during times of plenty was an advantage. In modern times food is continually abundant, and people with "thrifty genes" readily become obese. Although current research tends to support the theory, other factors may also be involved.

Diabetes is more prevalent in families with diabetic relatives. It is more common among women than men and among people who are overweight. The increasing incidence of diabetes among Indian and Inuit people may be related to increased availability of carbohydrate foods and decreased activity resulting in obesity.

Cause

The basic cause of diabetes concerns the pancreas, a gland lying behind the stomach. This gland produces two hormones: insulin which lowers blood sugar, and glucagon which increases blood sugar. In the non-diabetic, there is a balance between these two hormones resulting in normal blood sugar levels.

(C.H.R.'s Meeting in North Battleford, Saskatchewan)

While the exact cause of diabetes is not fully understood, people with diabetes are unable to use glucose, the body's chief source of energy. In the diabetic, glucose accumulates in the blood and much of the excess glucose is lost by way of the urine. The symptoms include frequent urination, thirst, weakness, fatigue, hunger, and loss of weight. Diabetes, in some cases, may be controlled by a balanced diet which restricts energy intake, or in more severe cases, with insulin injections or tablets combined with a special diet. Currently research is exploring the role of stress as a factor inducing diabetes.

Role of Nutrition in Treatment and Prevention

Since diabetes is more common among people who are over 40 and overweight, weight control, an energy balanced diet and regular exercise would reduce the chances of becoming diabetic – especially if the condition exists in the family.

For the diabetic, an energy balanced diet is essential in order to control the glucose level and enable him/her to lead a normal life. Professional advice should be sought to achieve the right balance.

Cardiovascular Disease

With changing lifestyles, including diet, a growing number of Indian and Inuit people are suffering from cardiovascular disease (i.e., heart attack, stroke, arteriosclerosis). In fact, within the 35 to 54 age group, death from cardiovascular disease among Indian people is almost twice the national rate. [3]

Today economical, store-bought meats like bologna, weiners, luncheon meat and hamburger often replace the wild game and fish of the traditional diet. These meats contain considerably more fat than most wild game or fish. Increased fat increases the risk of cardiovascular disease. It is possible that fish oils, which contain a different kind of fat than beef or pork, may have beneficial effects by reducing cholesterol. [6] [7] By choosing fish, lean meat or poultry, eating smaller servings of meat, trimming visible fat from beef or pork and skimming off fat from soups, you can reduce the amount of fat in the diet and thereby reduce the risk of heart disease.

Research is also indicating that a lack of fibre in the diet may be a factor in cardiovascular disease. Again the traditional diet contained many sources of fibre such as whole grain cereals, wild vegetables, legumes, nuts, etc. Unfortunately, many of these foods have been replaced with highly refined foods such as sugar and white flour. By eating whole meal porridge, using spaghetti or macaroni with vegetable soups or having baked beans and legumes occasionally, the necessary fibre can be provided in today's non-traditional diet.

Salt is another food which was not used in excess in the traditional diet. But today many foods contain salt (e.g., potato chips, bacon, luncheon meats, cake mixes, salted nuts, pickles). Too much salt in the diet may be a factor in causing hypertension (high blood pressure). To cut down on the amount of salt in your diet, you can taste your food before using the salt shaker and choose less salty snack foods.

To reduce the risk of cardiovascular disease it is recommended that people:

- follow a moderate, balanced diet (a variety of foods, including whole grain cereals, fruits and vegetables; moderation in the amount of fat, sugar, salt and alcohol)
- avoid overweight (see preceding section)
- reduce stress
- be physically active (regular exercise)
- avoid smoking.

(Photo from the Photo Section, Department of Indian and Northern Affairs, Ottawa)

Alcohol

Effect of Alcohol on Nutrition and Health

The routine use of alcohol is known to be detrimental to health and nutritional well-being. Alcohol use may replace nutritious food choices. Since alcohol contains only calories and almost no vitamins or minerals, the body is deprived of the nutrients it needs for good health.

Alcohol can also interfere with the absorption and use of a number of nutrients including folic acid, thiamin, vitamin B_6, zinc and magnesium. Foods rich in these nutrients should be selected in the diet to replete body stores.

Alcohol, in excess, contributes to the risk of cardiovascular disease, liver disorders and digestive difficulties, not to mention the disruptive effect on family life.

Role of Nutrition in Rehabilitation

A well-balanced diet is essential in any rehabilitation program if the individual is to have sufficient energy and nutrients (especially vitamins and minerals) to regain health.

Vitamin A

Nutrition surveys among Indian and Inuit groups suggest that vitamin A intakes are lower than needed for good health.[2] While there is no concrete evidence of serious vitamin A deficiency, it is believed that the high incidence of upper and lower respiratory infections, and a lowered resistance to infection among Indian and Inuit, may be caused by an inadequate intake of vitamin A.

(Photo from Audio-Visual Services, Health and Welfare Canada)

This situation is a relatively recent event which is probably the result of changing food habits. A traditional diet provided adequate amounts of vitamin A. Table – 2 lists a number of traditional and non-traditional foods which may be considered sources of this vitamin.

Requirement

The requirement for vitamin A varies with age ranging from 400 RE per day for children to 800 RE for teenage girls and 1000 RE for adult men. The need for vitamin A is increased during pregnancy and breastfeeding. Since the body is able to store vitamin A, one serving of foods such as liver would meet the body's need for many days.

Table 2
Vitamin A Content of One Serving of Some Foods*

VERY GOOD (More than 400 RE)	GOOD (200-400 RE)	FAIR (Less than 200 RE)
Carrots	Fireweed	Peas
Dandelion greens	Purslane, raw	Purslane, cooked
Dock		Tomatoes
Lamb's quarters		Turnip
Seaweed (Laver)		High bush cranberries
		Peaches
		Salmonberries
		Prunes
Liver (caribou, seal, moose, deer)	Goose	Pickerel
Eel	Pheasant	Pike
Crab	Kidney	Atlantic Salmon
Sea urchin eggs	Caribou stomach contents	Sockeye Salmon
Fish liver		Whitefish
	Ooligan grease	Margarine
		Butter
		Cornmeal
		Milk, fluid
		Milk, evaporated
		Cheese, cheddar

* See serving size and values as found in nutrient bar graphs and table of nutrient values.

Vitamin C

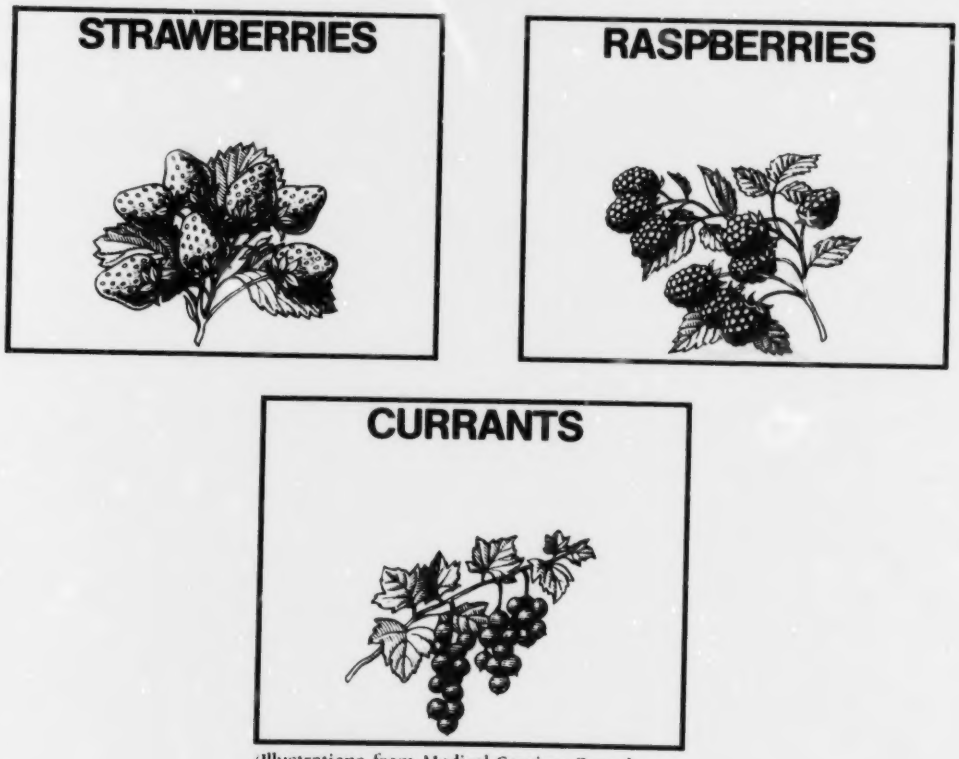
In the early seventies, nutrition surveys found inadequate intake of vitamin C, especially among women over 54 years of age. Biochemical tests found between 50 and 80% of adults and more than 10% of children and teenagers at high risk. A very high prevalence of bleeding gums, a characteristic sign of vitamin C deficiency, was observed among the Inuit.[2]

More recent studies show that fruit flavored crystals and drinks are supplying the vitamin C needed, especially among children and adolescents. However, this is not necessarily a good trend since fruit drinks contain none of the other vitamins and minerals normally found in fruit or fruit juice.

Requirement

Since vitamin C is not stored to any extent in the body, foods providing vitamin C are needed regularly.

The average daily recommended vitamin C intake is 20 milligrams for children up to age 3, and 60 milligrams for an adult man or 45 milligrams for an adult woman.



(Illustrations from Medical Services Branch, Health & Welfare Canada)

Effect of Food Preparation on Vitamin C

While vitamin C is readily available from a variety of fruits and vegetables, it is important to recognize that vitamin C is easily destroyed by overcooking or improper storage. Green vegetables, if allowed to wilt, lose much of their vitamin C content. Potatoes stored for long periods at room temperature will lose a considerable amount of vitamin C.

Acid fruits and vegetables (e.g., tomatoes) lose less vitamin C on cooking than non-acid foods. Vitamin C is extremely soluble in water. To retain as much vitamin C as possible, fruits and vegetables should be eaten raw, stored in a cool place, cooked in as little water as possible for the shortest period of time, baked or used in soup. Since freezing destroys little, if any, vitamin C, it is an excellent way of preserving fruits and vegetables. Similar care needs to be taken in cooking frozen vegetables.

There are many traditional foods including berries and wild greens which are excellent sources of vitamin C. The vitamin C content of a number of foods is presented in the following table. (Table 3).

Table 3

Vitamin C Content of One Serving of Some Foods*

VERY GOOD (More than 40 mg)	GOOD (20-40 mg)	FAIR (Less than 20 mg)
Cabbage, raw	Alfalfa sprouts	Dandelion greens, cooked
Dock, cooked	Cabbage, cooked	Fiddlehead greens
Fireweed, raw or cooked	Dandelion greens, raw	Seaweed (Laver), dried
Dock, raw	Lamb's quarters	Apples, fresh, dried
Lamb's quarters, raw	Peas	Blackberries
High bush cranberries	Potatoes	Elderberries
Currants, black	Purslane, raw	Cranberries, high or low bush
Rose hips	Tomatoes	Raspberries
Strawberries	Turnip	Salmonberries
Apple juice, vitaminized	Currants, red/white	Black Tree Lichen
Bakeapples	Gooseberries	
Evaporated milk (fortified)		
Oranges	Beef liver, raw	Herring eggs on Kelp
	Deer liver, raw	Chicken liver
	Oysters, raw	Clams
		Fish eggs
		Fish liver

* See serving size and values as found in nutrient bar graphs and table of nutrient values.

Iron

The Nutrition Canada Survey found that Indian and Inuit adolescent girls did not appear to be meeting their need for iron.[2]

Again iron deficiency would appear to be related to changing food habits as there are many excellent sources of iron among traditional foods (Table 4).

Requirement

The requirement for iron is based on the amount needed to provide a reasonable level to prevent anemia and maintain adequate stores. Over a long period of time the body can adapt to a low or high iron intake by adjusting the amount of iron absorbed from food. Women have a higher requirement for iron than men. The recommended average daily intake of iron ranges from 5 milligrams for the 3-year-old to 14 milligrams for the adult woman. Iron is better utilized when the diet provides adequate vitamin C. Recent evidence suggests that vitamin C must be present at the same meal if non-heme iron (the form of iron found in vegetables and cereals) is to be absorbed most effectively. Similarly, eating meats, fish and poultry (containing amino acids) promotes the absoption of non-heme iron from the diet, while drinking tea (containing tannin) at the same meal can lower the absoption of non-heme iron by 50%.

(Photo by Richard Hill)

Table 4

Iron Content of One Serving of Some Foods*

VERY GOOD (More than 6 mg)	GOOD (3-6 mg)	FAIR (1-2 mg)
Seal	Beef	Black bear
Animal blood	Caribou	Beaver
Liver	Moose	Muskrat
Black Sea Prunes	Pork	Pork Sausages
Clams	Walrus	Rabbit
Oysters, Pacific	Duck	Ground Squirrel
Herring eggs on kelp	Intestines	Turkey
Ooligan, smoked	Stomach contents (Caribou)	Wieners
Pumpkin, Squash seeds	Cod, dried, salted	Egg
	Lake trout	Goose
	Oysters, Atlantic	Pheasant
	Dry beans	Bone Marrow
	Dry peas	Tongue
	Sunflower seeds	Arctic char
		Herring
		Mackerel
		Salmon
		Whitefish
Black Tree Lichen	Purslane	Abalone
Seaweed (laver, kelp)	Raisins	Shrimp
prunes, dried		Fish eggs
		Alfalfa sprouts
		Dandelion greens
		Dock
		Lamb's quarters
		Peas
		Seaweed (Dulse)
		Apples, dried
	Bannock	
	Macaroni, enriched	
	Bread, enriched	
	Bread, whole wheat	

* See serving sizes and values as found in nutrient bar graphs and table of nutrient values.

Calcium

Food patterns of Indian and Inuit show considerably lower dietary intakes of calcium than the general population and suggests perhaps better absorption of calcium. On the other hand, a lower intake of calcium may contribute to osteoporosis seen in some older Indian and Inuit women or to the high rates of dental caries seen today among Indian and Inuit children.

(Photo from Audio-Visual Services, Health and Welfare Canada)

Requirement

"The requirement for calcium cannot be defined with the degree of precision that applies to most other nutrients because the body adapts to a range of intakes by regulating the excretion in the urine and the efficiency of absorption from the intestine. Consequently, frank deficiency of calcium is rarely seen in human subjects".[7]

Requirement levels in Canada are based on the food patterns of the general Canadian population. Approximately 800 milligrams of calcium is the average daily recommendation for a girl aged 13 to 15 years. The need for calcium gradually rises during childhood from 350 milligrams for a 3-year-old child to a peak of 1100 milligrams for a boy aged 13 to 15 when bone growth is greatest, and drops to 700 milligrams for the adult man and 800 milligrams for the adult woman. The need for calcium remains at this level throughout adult life except during pregnancy when the need rises to 1200 milligrams.

Although calcium requirements are not definitive it is recommended optimum levels be targeted, choosing foods rich in calcium. (Table 5)

Note: *Today calcium-fortified white flour is available on the Newfoundland and northern market and is a good choice. Calcium fortified flour is recommended for bannock.*

Table 5

Calcium Contents of One Serving of Some Foods*

VERY GOOD (More than 300 mg)	GOOD (150-300 mg)	FAIR (Less than 150 mg)
Cow's milk	Cheese, cheddar Yoghurt	
	Cod, dried, salted	Fish Head Soup
	Canned Salmon (with bones)	Stomach contents (caribou)
	Herring Eggs on Kelp	Clams Oysters Fish liver Mussels Dry beans Sunflower seeds
Seaweed (Kelp)	Lamb's quarters Seaweed (Laver) Broccoli	Black Tree Lichen Dandelion greens Dock Purslane Seaweed (Dulse) Turnip

* See serving sizes and values as found in nutrient bar graphs and the table of nutrient values.

Note: *Milk, fluid or evaporated, also contains vitamin D and if they are not used as part of the diet, other sources of vitamin D such as fish liver, fish liver oil or a vitamin D supplement are recommended.*

Lactose Intolerance

Many Indian and Inuit people, unaccustomed to drinking milk, may experience some discomfort (gas and bloating) digesting milk. This condition, known as "lactose intolerance", is caused by the absence of the enzyme "lactase" which converts milk sugar (lactose) to lactic acid in the small intestine. It should be mentioned that lactose deficiency is not normally present at birth and develops with time, usually it only becomes noticeable in late childhood (4-19 years). For most people where milk has been a traditional part of the diet, there is a sufficient amount of this enzyme present in the digestive tract. If sufficient lactase is not present, lactose will be broken down by bacteria in the large intestine causing flatulence.

(Photo from Audio-Visual Services, Health and Welfare Canada)

Some Indian and Inuit people enjoy milk and have no difficulty digesting it as long as they drink it in small quantities. Others, on the advice of a nutritionist, have discovered "lactase tablets" which may be added to milk to provide the necessary lactase enzyme. Others eat cheese in which the lactose has been naturally extracted. Yogurt or buttermilk retaining the bacterial culture can also be tolerated.

Vitamin and Mineral Supplements

All of the vitamins and minerals necessary for good health are found in food, and under normal circumstances, a balanced diet provides sufficient quantities. Under certain circumstances, vitamin or mineral supplements may be indicated. For example, certain vitamin and mineral supplements may be prescribed during pregnancy or breastfeeding. Supplements may also be prescribed in the event of certain illnesses which affect the appetite or the body's ability to absorb nutrients. However, in all cases, such supplements should only be taken after a thorough assessment by the physician or nutritionist.

Megavitamin therapy, while promoted by many faddists as a cure for many common disorders, can be quite harmful.

Water Soluble Vitamin Supplements

Contrary to popular belief, megadoses of water-soluble vitamins (C, B vitamins) may have serious effects and caution should be exercised.[8]

Vitamin A Supplements

Excessive intakes of pre-formed vitamin A (retinol) may be toxic. Symptoms include scaliness of the skin and mucous membranes; abnormal hair growth; pain and tenderness in the long bones; headache; irritability; loss of appetite and fatigue. The severity of the symptoms are directly related to the length of time the excess amount of vitamin A has been consumed. Studies have shown that symptoms appear when the amount in the liver exceeds 10 times the normal level.

It is unlikely that toxicity would occur under normal conditions although symptoms of acute toxicity have been associated with eating liver from polar bear, seal and shark. Henry Isluanik, describing Inuit food habits at the Nutrition Workshop (October 1977), explains:

> "It was dangerous to eat the liver of the big seal known as Oguk. This was too strong, it was even harmful to the dogs who became sleepy and lazy, but they would recover. The liver of the polar bear is also dangerous".

Today the major hazard results from taking excessive vitamin A supplements.

Vitamin D Supplements

Vitamin D is often prescribed for infants and for women during pregnancy to ensure sufficient body stores and prevent the development of infantile rickets. Excessive doses of vitamin D are toxic. Excessive intake, which might result from the unwarranted use of vitamin D supplements, has been associated with infantile hypercalcaemia. "It is recommended that the total amount of vitamin D ingested from all sources by infants and by pregnant and lactating women should not greatly exceed the recommended amounts."(1)

Vitamin C Supplements

A normal healthy person can meet the need for vitamin C by including berries, fruits, vegetables and organ meats in the diet. There is no evidence to support the claim that vitamin C will cure or prevent a cold. It has been found that extra vitamin C will lessen the symptoms. This extra amount may be obtained by drinking a couple of glasses of fruit juice or rose hip tea. Large doses of vitamin C over an extended period of time places an extra strain on the kidney and may lead to the formation of kidney stones, diarrhea, and bleeding ulcers.

Iron Supplements

Under normal conditions a healthy individual can obtain enough iron by eating a variety of food. During pregnancy and breastfeeding, iron supplements may be necessary.

In some people, iron supplements taken over an extended period of time may cause irritation of the gastrointestinal tract. Infants are particularly susceptible.

Nutrition During Pregnancy and Breastfeeding

A mother, who is well nourished before and during her pregnancy, has a greater chance of producing a healthy baby. By using the right kind and amount of food, and avoiding alcohol and smoking, a woman will ensure the best growth and development of her baby. A gradual weight gain of 10.9 to 13.6 kg (24 to 30 lbs) during pregnancy helps ensure a normal baby of at least 3.5 kg (7.7 lbs). Pregnancy is not the time for weight reduction diets. Inadequate nutrition could deprive the fetus of the essential energy and nutrients required for proper development. These nutrients, such as protein, calcium, iron, vitamin D, folacin and vitamin B_{12}, must be provided in the mother's diet. [1] [9] The mother's energy needs increase by about 400 kJ (100 kcal) per day during the first trimester and by 1300 kJ (300 kcal) per day during the second and third trimester. This additional energy and nutrients may be supplied by:

- Increasing the number of servings of Calcium-rich foods (Table 5) to 3 to 4 per day
- Increasing the number of servings from the Bannock, Bread and Cereals group to five per day
- Choosing fruits and vegetables rich in vitamin A, vitamin C, iron and folacin (Tables 2,3 and 4)

The fibre of wholewheat bannock, breads and cereals, berries, wild greens, or vegetables, helps to prevent constipation during pregnancy. Wholesome soups made at home and frequent small nutritious snacks of bannock or dried meat help reduce nausea and heartburn. Sources of iron in the diet, particularly the liver of small animals or fish, will reduce the need to take iron supplements.

(Photo from the Photo Section, Department of Indian and Northern Affairs, Ottawa)

Alcohol must be avoided during pregnancy and breastfeeding. It is harmful to the fetus and to the nursing baby.

The effects of drinking during pregnancy on the newborn range from permanent behavioural or learning problems to the more severe condition knows as "Fetal Alcohol Syndrome" (F.A.S.). Children born with F.A.S. are unusually small in weight, length, head size and brain size. They generally do not grow as well as other children. About 1/3 of these children will have heart defects and the majority are also mentally handicapped. [10]

Breastfeeding

Nursing at the breast is the best method of infant feeding, preferably to 6 months of age or longer. A vitamin D supplement is usually given to breastfed babies until the baby starts using vitamin D fortified cow's milk or formula. Infant cereal fortified with iron can be introduced at 4 – 6 months of age.[1]

Note: *The Summer 1982 edition of Nutrition Newsletter provides valuable information concerning traditional practices during pregnancy and breastfeeding.*

(Photo from Audio-Visual Services, Health and Welfare Canada)

Food Cost and Availability

Over the past 10 years food costs have more than doubled, making it difficult for many families to manage, especially those on a limited income.

In some cases, income supplements provided to communities in isolated areas may be unrealistically low. Some adjustments will be necessary if people are to obtain an adequate diet.

However, even within a limited income it is possible, through good management, to reduce food costs without sacrificing good nutrition.

At the community level people can work together to identify and improve the availability of nutritious foods, their purchasing power, and the nutrition of the family. They can share ideas about cooking and preserving food. In some communities people have already formed cooperatives for this purpose.

The following represents a few suggestions which might be considered to cut food costs. Undoubtedly, you will have more ideas to add to this list.

(Photo from the Photo Division, National Film Board, Ottawa)

Suggestions for Cutting Food Costs

- Consider a co-op to organize methods of financing to establish refrigeration and other storage or sales facilities or to arrange bulk food shipments.
- Organize group transportation for shopping or shipping.
- Develop community gardening technology. Collaborate in the development of greenhouses, hydroponics, vegetable storage, smokehouses for fish.
- Choose vegetables fresh in season. When fresh is unavailable choose the best buys of frozen, dried or canned.
- Explore the use of new technology for food processing or storage in order to maximize the nutrient value and availability of food gathered by hunting and fishing.
- Pick local berries in season. Gather wild greens, roots and seeds. Eat these fresh, or else can, dry or freeze them for storage.
- Take advantage of the organ meats from game and fish which are rich in vitamins and minerals.
- Use dry beans or peas in soups and casseroles as a calcium source and a meat alternate.

Food-Borne Illness

Safety of Raw vs Cooked Meats and Fish

A number of species of fish and game may carry parasites or bacteria which, if not destroyed by cooking, may cause serious illness or death.

Traditionally, native foods were handled with care and cleanliness. Unfortunately, many of these practices have been lost and need to be revived or adapted to modern lifestyles.

Tapeworm

Tapeworm cysts may be present in certain species of fish. Raw, dried or smoked fish may be carriers. If present and the fish is not sufficiently cooked, these cysts will mature and develop tapeworms within the intestinal tract of anyone who eats them.

Trichinosis

Bear, walrus and moose, like pork, may carry microscopic larvae (trichinosis) in the muscle. If present and the meat is not well cooked these larvae invade the small intestine, lodging and causing muscular pain, fever and weakness.

Bacterial Infection

Rabbit, beaver or muskrat may become infected by fleas or ticks. If eaten raw, or insufficiently cooked, the bacteria carried by fleas or ticks may infect the flesh and cause the illness known as Rabbit Fever. The symptoms include boils, inflammation of the lymph glands, headache, chills and fever.

Salmonella

Raw fish eggs, insufficiently cooked smoked fish or improperly stored protein foods of any kind may carry salmonella. Salmonella bacteria may cause an infection of the intestinal tract with symptoms similar to the 24-hour flu – headache, diarrhea, fever and cramps. Infants and elderly people are most seriously affected. Salmonella are easily destroyed by cooking.

(Teaching safe canning methods, Nuxalk Food and Nutrition Project, Bella Coola, 1984. Photo by J. Steckle)

Botulism

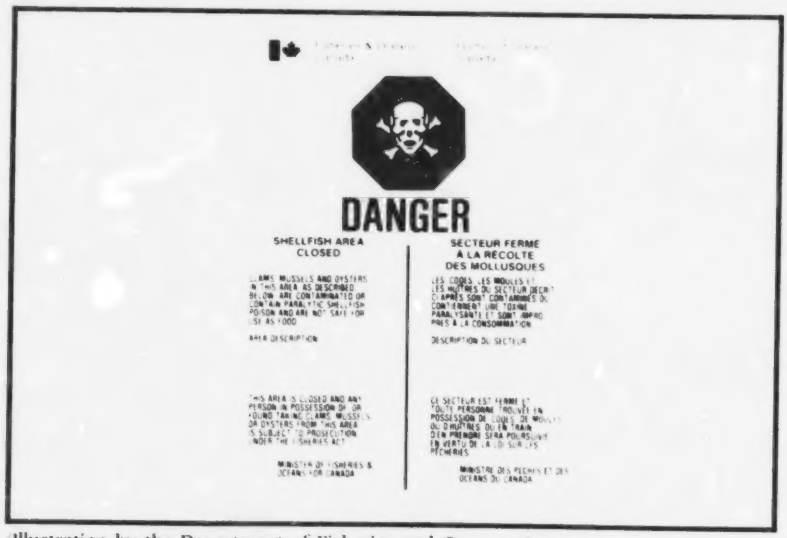
Indian and Inuit people have been victims of the deadliest form of food poisoning known to man – Botulism. This fatal illness is associated with home prepared foods improperly preserved and stored under anaerobic (in the absence of oxygen) conditions, eaten without adequate heating, for example, fish or meat improperly placed in airtight plastic bags, fish eggs improperly fermented, and raw seal left on the beach or small game refrigerated, ungutted. Other cases in Canada have been associated with poor canning techniques of meat and fish or plastic wrapping of mushrooms, eaten in salads.

The deadly botulism toxin develops from botulinum spores in improperly preserved low acid foods, such as fish and meat, when stored in a sealed jar, can or plastic bag without air. If you are suspicious of the food "throw it out;" otherwise boil it for 10 minutes to destroy the toxin before even tasting.

Red Tides

Red tides are potentially catastrophic events in coastal waters and are becoming more common in the St. Lawrence Estuary, the Bay of Fundy and the Pacific coastal regions.(11) At present, attempts are being made to improve surveillance of these waters and to predict the occurence of "red tides".

Microscopic algae make up an essential part of the food chain for all marine life and occur in a vast variety of species. Normally, they go through yearly cycles of rapid growth and decay. Bursts of growth are called blooming. Under certain water and weather conditions this bloom may be concentrated in small areas. In such concentrated numbers the algae cause a discolouration of the water. This colour is due to the natural pigment in the algae which traps sunlight providing oxygen for marine life. Different algae have different pigments and therefore many colours may result. Since many of the discolourations in marine waters are red, hence the name "red tide". The same phenomenon may occur in fresh water, causing cloudiness. There it is called "Water Bloom".



(Illustration by the Department of Fisheries and Oceans, Ottawa)

When such large numbers of algae die, the marine life is deprived of the oxygen essential for its survival. The resulting death of fish and shellfish may be extensive. Shellfish such as clams, unable to escape quickly, are most seriously affected.

The microorganisms of the "red tide" may also release toxins, some of which are poisonous to shellfish. Others, such as the one responsible for "paralytic shellfish poisoning" may accumulate in shellfish such as clams. Eating several infected clams may prove fatal to humans.

Because of the danger of paralytic shellfish poisoning, warning signs are usually posted in areas affected by red tides. Surveillance of coastal waters in remote northern areas or on the Pacific coast is difficult. Therefore, people must be cautious and avoid eating shellfish in areas where red tide might be suspected.

(Photo from the Photo Section, Department of Indian and Northern Affairs, Ottawa)

PART SIX
Developing a Community Food Guide

Developing a Community Food Guide

Today, a growing concern for nutrition is beginning to have an impact on food habits as people recognize the integral relationship between health and food.

It is possible for an individual or a community to develop a food guide which translates nutrient needs into food choices and which recognizes cultural and personal preferences.

There are many different combinations of food which will satisfy the body's need for energy and essential nutrients but, in order to develop a guide which is acceptable and appropriate, certain principles must be considered. A central principle is that a guide should provide a framework for choosing foods to satisfy nutrient requirements as described in "Recommended Nutrient Intakes for Canadians" (Appendix G). Further:

1. A Food Guide is based on COMMON FOOD HABITS. For example, a realistic food guide for Indian or Inuit would recognize the traditional high meat/fish diet, the use of most edible parts, the use of traditional fats and the limited use of dairy products. It would also include those foods of high nutrient density that are popular, and a wide variety of nutritious snacking foods.

2. A Food Guide recommends sufficient VARIETY and FLEXIBILITY to ensure that the food choices and the amounts eaten supply all of the necessary nutrients, particularly those which may be lacking in the diet (vitamin A, C, iron and calcium). Variety is achieved during changing seasons or by choosing store foods to supplement foods harvested.

3. To control weight it is also necessary to maintain an ENERGY BALANCE. This can be accomplished by choosing foods which supply the necessary nutrients at an appropriate energy level. For example, the servings recommended from each of the four food groups in the sample food guide provide approximately 1200 to 1400 calories (5000 to 6000 kJ).

   Although the nutrient needs are met with these choices, most people require more energy to maintain physical activity. This additional energy can be supplied by eating more or larger servings from each group or by including additional nutritious food choices.

   However, since energy requirements decline in adult life, it is also important to prevent and control obesity by avoiding excessive energy consumption and maintaining an adequate level of nutrients and physical activity.

4. All foods are best eaten in MODERATION. This is particularly true of fat, sugar and salt. Nutritionists recommend that fat contribute, at most, 35% of the total calories and that the diet include a source of polyunsaturated fatty acid most commonly found in vegetable oils and fish oils.

   If alcohol is consumed, it is recommended that one use limited amounts since alcohol contributes empty calories and excessive consumption may, in addition to the numerous adverse social and health effects, interfere with the absorption and use of many essential nutrients. Alcohol also depletes body stores of essential nutrients.

5. Finally a realistic food guide recommends food choices at a REASONABLE COST, and foods that are READILY AVAILABLE.

(Photo from the Photo Division, National Film Board, Ottawa)

The proposed Community Food Guide is very similar to Canada's Food Guide with two major exceptions. The Milk and Milk Products group has been changed to Foods Containing Calcium group (i.e., foods which are good sources of calcium) in order to recognize the limited use of milk and milk products by some native people. However, this does not mean that milk or milk products should not be considered or that Canada's Food Guide cannot be followed. Milk and milk products are the richest sources of calcium – so important to the growing child, adolescent and the pregnant or nursing woman. Milk is also fortified with vitamin D. If milk is used in limited amounts, another source of vitamin D is needed such as fish liver oils or exposure to sunshine. The other major difference is in the Meat, Fish, Poultry and Alternates group. This group has been changed to Game, Fish and Birds. The meat alternates included in Canada's Food Guide have been moved to the Foods Containing Calcium group since they are considered good sources of calcium. If a traditional diet of lean game and fish is still used, it is recommended that some natural fats be included in order to ensure sufficient fat and energy in the diet.

If your community is interested in developing its own food guide, this can be done. It must be based on the evaluation of current food practices, a comparison of the cost of locally harvested versus purchased foods and an assessment of the nutrient needs of the community to achieve the recommended nutrient intakes for all conditions. (Table G).

The following is one example of a food guide which fulfills the need for essential nutrients and recognizes the importance of game/fish and a wide variety of traditional foods.

Table 6

Proposed Community Food Guide

GAME, FISH, AND BIRDS*

2 servings recommended

Some examples of one serving:

2 to 3 ounces (60-90 g) cooked deer, moose, caribou, rabbit, duck
2 to 3 ounces (60-90 g) liver (deer, moose, caribou)
2 to 3 ounces (60-90 g) raw seal
1 ounce (30 g) dried caribou, moose, deer
2 wild duck eggs
3 ounces (90 g) dried salted cod, fresh salmon, trout
3 ounces (90 g) canned salmon
6 ounces (180 g) clams

* Include animal fat or fish oil (e.g., ooligan grease, seal fat, goose fat) in moderation

BANNOCK, BREADS AND CEREALS

3-5 servings recommended

Examples of 1 serving:

1 serving (37 g) of bannock
1 slice (30 g) white enriched or whole wheat bread
1/2 cup (125 g) cooked oatmeal
1/2 cup (125 g) cooked enriched macaroni

NOTE: Vitamin D is needed to utilize calcium and phosphorus. Vitamin D is adequate when consumed in fortified milk, or in fish liver oils, or if body is regularly exposed to sunlight.

BERRIES, GREENS AND OTHER FRUITS AND VEGETABLES

4 to 5 servings recommended

Some examples of one serving:

1 cup (250 mL) raw wild greens (e.g., dandelion greens, lamb's quarters)
1/2 cup (125 mL) cooked greens (fresh,canned/frozen)
1 potato (150 g)
1/2 cup (125 mL) carrots
1 cup (250 mL) raw cabbage
1/2 cup (125 mL) canned tomatoes
1/2 cup (125 mL) berries
5-8 rosehips (10-20 g) raw

FOODS CONTAINING CALCIUM

Recommended servings

Children up to 11 years	**2-3 servings**
Adolescents	**3-4 servings**
Pregnant and nursing women	**3-4 serving**
Adults	**2 servings**

Some examples of one serving:

1 cup milk (250 mL) (whole, 2%, skim, reconstituted evaporated or powdered)
1-1/2 ounce (45 g) Cheddar Cheese
3/4 cup (188 mL) yoghurt
1 cup (250 mL) fish head soup
1-1/4 cups (30 g) dried kelp
2/3 cup (166 mL) raw wild greens
3 ounces (90 g) canned salmon with
2 cups (500 mL) cooked dry beans
1 cup (150 g) sunflower seeds
2 stalks (300 g) broccoli
3 ounces (90 g) sardines (canned with softened bones)

Game, Fish and Birds Group

Game, fish and birds are major sources of protein and supply iron, niacin, thiamin, riboflavin, vitamin A, vitamin B_{12} and fat. Fish liver oil also provides vitamin D.

Each serving from the Game Fish and Birds group supplies approximately 12 to 27 grams of protein.

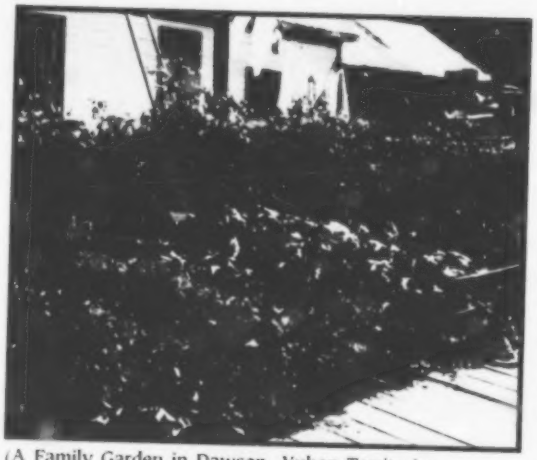
The proposed Community Food Guide recommends 2 servings per day of game, fish or birds to meet the requirements for protein and niacin. It should be noted that many of the game sources and fish are 50% lower in energy value than domestic meats, due to their low fat content.

When the larger servings (90 g) of lean meat or fish are eaten, most of the protein needs are met although some protein is also supplied by the Bread and Cereal group and the Foods Containing Calcium group. The use of organ meats from animals or fish (liver, kidney, brain, heart, tongue, moose nose) is also highly recommended as these foods are rich sources of B vitamins (niacin, riboflavin), iron and vitamin A. Liver is also considered a good source of vitamin C.

Most fish are not good sources of iron. Therefore, when fish is selected from this group, it is important to choose iron-rich foods from other food groups, such as whole grain and enriched cereals or breads and green leafy vegetables or seaweed or to choose one serving of iron-rich protein foods in the same day.

(Photo from the Photo Division, National Film Board, Ottawa)

Berries, Greens and Other Fruits and Vegetables Group



(A Family Garden in Dawson, Yukon Territories. Photo by J. Steckle)

Fruits and vegetables supply vitamin A, vitamin C, iron, folacin, carbohydrate, trace minerals such as copper and zinc, and fibre. Fruits and vegetables are also sources of other minerals such as potassium and iodine.

Four to five servings of Berries, Greens and other Fruits and Vegetables are recommended. At least 2 vegetables should be included since leafy green and yellow vegetables have more vitamin A, folacin and iron than fruits.

Since the vitamin and mineral content of different fruits and vegetables varies considerably, it is wise to include a variety of both.

The vitamin A, vitamin C, iron and calcium value of some fruits and vegetables are provided in Tables 2, 3, 4 and 5. (See also Appendix K).

Fresh, canned and frozen fruits and vegetables may be used interchangeably. There is always some loss of water soluble nutrients (e.g., vitamin C) on storage, so freshly picked fruits and vegetables would contain the highest amount of vitamin C. Quality frozen products can surpass fresh products in nutrient value if fresh products have been shipped long distances.

Bannock, Bread and Cereal Group

Bannock, bread and cereals, especially whole grain and enriched products, are important sources of carbohydrate, protein, thiamin, riboflavin, niacin and iron.

Each serving from the Bannock, Bread and Cereals group provides approximately the same amount of thiamin, riboflavin, niacin and iron as one slice of whole grain bread.

Three to five servings of whole grain or enriched breads and cereals are recommended each day.

Whole grain cereals, whole wheat flour and bread are also a good source of fibre which is necessary for proper elimination from the intestines.

There are many kinds of breads and cereals available today. From a nutritional point of view it is best to avoid those containing a large amount of added fat or sugar. Doughnuts, cake, cookies, pre-sweetened cereals and granola-type cereal bars contain a high percentage of sweeteners and/or fat, making them a poor choice for this food group.

(Photo by S.A. Stevens, 1984)

Consumers in the northern communities are advised that calcium-enriched white flour is available on the northern Canadian market and is a preferred choice for domestic use.

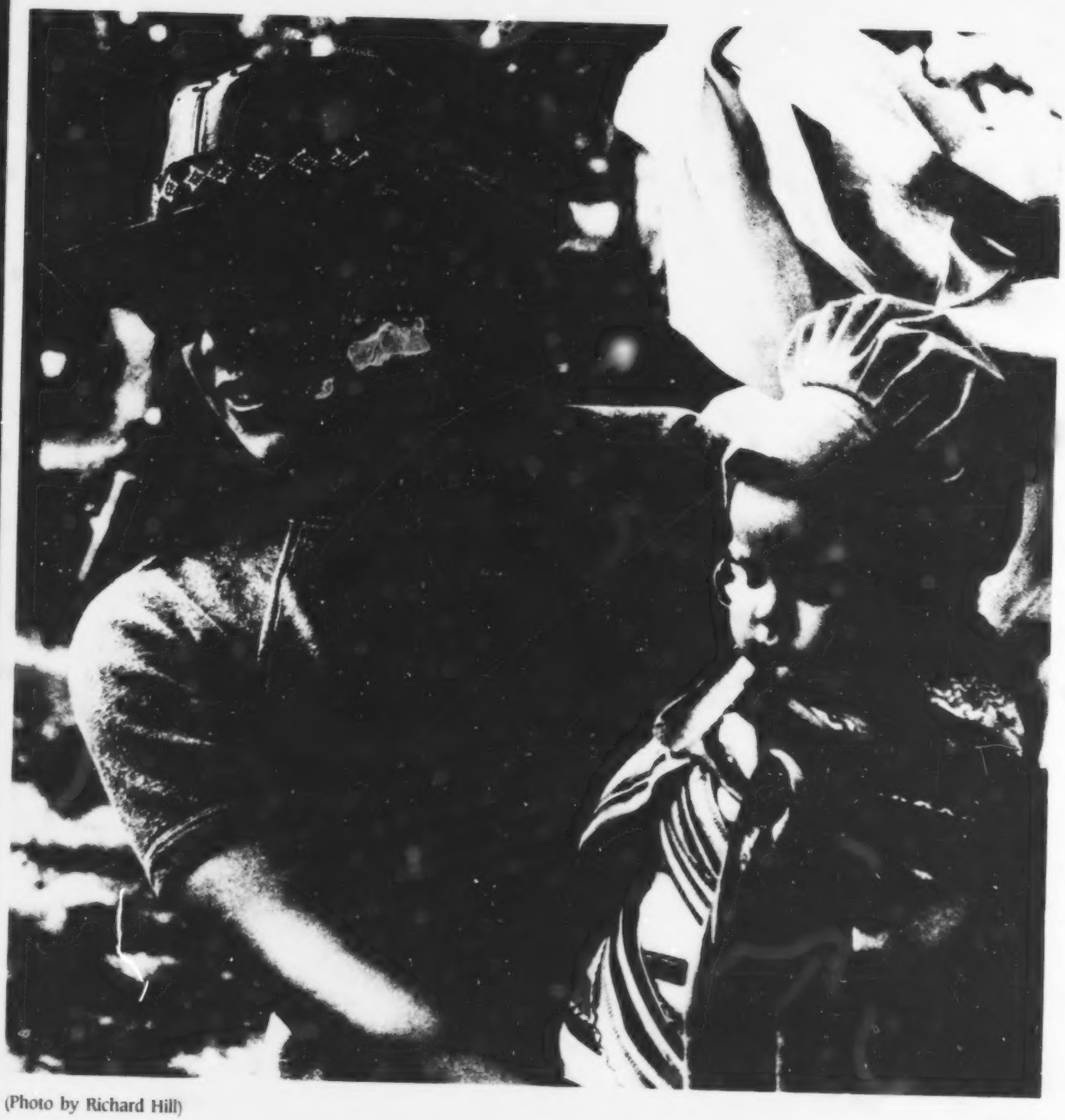
Berries, traditionally used as a sweetener for a variety of foods, can be promoted as a flavouring for breakfast cereals instead of sugar. This would add a considerable amount of vitamin C and other essential nutrients and would facilitate the absorption of the iron present in the cereal.

Foods Containing Calcium Group

(Photo from the Photo Section, Department of Indian and Northern Affairs, Ottawa)

The proposed Community Food Guide recommends that foods which are good sources of calcium be included in the diet.

Each serving from this group provides approximately 150 - 300 mg of calcium. Two to four servings are recommended, according to age and sex. A review of sources of calcium in the local foods preferred (See Table 5) will help establish a method of meeting requirements. Vitamin D is needed to utilize calcium and phosphorus in bone growth and repair and tooth formation. Adequate sources of vitamin D are available through the use of foods such as fortified milk or fish liver oils or by regular exposure to sunlight.



(Photo by Richard Hill)

PART SEVEN
Appendices

Appendix A

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Appendix C

Native Foods Included in Nutrient Bar Graphs – (as reported in common use)

MEAT

Animal Blood
Black Bear
Beaver
Deer
Caribou, Dried
Caribou Bone Marrow
Duck, Wild
Eggs, Wild Duck
Goose, Wild
Intestines, Cooked
Liver (Deer)
Moose
Muskrat
Ptarmigan
Rabbit, Wild
Seal
Ground Squirrel (Richardson)
Walrus
Stomach Contents, Caribou

FISH

Arctic Char
Clams
Cod, Dried
Crab
Eel (Anguilla rostata)
Fish Head Soup
Haddock
Fish Eggs (Carp, Cod, Haddock, Herring, Pide, Shad)
Lake Trout
Ooligan (Eulachon)
Pickerel
Pike
Salmon, Atlantic
Salmon, sockeye
Whitefish
Whitefish, smoked

VEGETABLES FRUITS

Cabbage
Carrots
Dandelion Greens
Dock (Rumex sp.)
Fiddleheads (Matteuccia struthiopteris)
Fireweed (Epilobium angustifolium)
Lamb's Quarters (Chenopodium album)
Potatoes
Seaweed (Porphyra sp.)
Tomatoes
Turnips

Bakeapples (Rubus chamaemorus)
Blueberries
Crabapples
Cranberries (Vaccinium macrocarpon)
Currants, Red/White
Gooseberries
Raspberries
Strawberries

CEREALS FATS

Bannock
Oatmeal Porridge
Macaroni (enriched)
Goose Fat
Ooligan Grease
Seal Fat

Appendix D

Wild Vegetables and Weeds – Edible Parts and Suggested Uses*

COMMON NAME	SCIENTIFIC NAME	EDIBLE GREEN PART	PREPARATION REQUIRED
Balsamroot	Balsamorhiza Sagittata	Root, peeled young flower buds and stems	raw or cooked
Black Tree Lichen	Alectoria sp.		leached to remove bitterness (tannin); used as thickener in soups or stews; provides bulk in diet
Burdock	Arctium minus (Hill)	young leaves, stalks	raw or cooked like asparagus (stalks must be peeled)
Cambium (under the bark) (hemlock, sitka spruce, birch)			fresh, dried and mixed with berries
Cattail (bulrush)	Typha latifolia	rootstocks, young shoots, young male flower spike (green) pollen (ripe)	raw, cooked, dried flour; raw, coiled or steamed, in soups stews; used for part of flour in baking
Cow Parsnip	Heracleum lanatum	peeled young budstems and leafstalks	raw in salads, in stews
Dandelion	Taraxacum officinale	young leaves, flower buds	raw in salads or cooked, preferably in two changes of water
Dock	Rumex crispus L. and relatives	young leaves, shoots	cooked like spinach
Fireweed	Epilobium angustifolium	young shoots	raw or cooked
Jerusalem Artichoke	Helianthus tuberosis	tuber	to replace potatoes; raw; steamed instead of starch they contain inulin, a complex carbohydrate which breaks down more slowly than starch in digestion

Appendix D (concluded)

Wild Vegetables and Weeds – Edible Parts and Suggested Uses*

COMMON NAME	SCIENTIFIC NAME	EDIBLE GREEN PART	PREPARATION REQUIRED
Labrador Tea	Ledum groelandicum Oeder	leaves	beverage: should use a weak brew and drink in moderation. Contains a number of chemicals which are toxic in large doses causing a narcotic and cathartic effect
Lamb's quarters	Chenopodium album L. and relatives	leaves, young stems	raw in salads or cooked in same way as spinach
Milkweeds	Asclepias syriaca L., A. speciosa Torr. and relatives	young leaves, shoots, half-ripe pods	always cooked; used like asparagus
Purslane	Portulaca oleracea L.	leaves, shoots	raw in salads or cooked like spinach
Seaweed (Kelp)	Macrocystis integrefolia	leaf	fresh or dried, cured Herring spawn on kelp-blades packed in salt or frozen; cut into thin strips, dried, eaten as snacks; fried
Seaweed (Laver)	Porphyra sp	leaf	dried, cured; eaten with fish, seafood dried, boiled, whipped for dessert
Sheep sorrel	Rumex acetosella L.	young leaves	raw in salads as flavouring or cooked like garden sorrel; good in sauces
Wild Rice	Zizania aquatical	fruit	dried; cooked
Yellow wood-sorrels	Oxalis species	young leaves, stems	raw in salads, as flavouring, or cooked like sorrel; good in sauces

* Adapted from: Edible Garden Weeds of Canada, Szczawinski, A., F., Turner, N.J. Ottawa: National Museum of Natural Sciences, Ottawa, 1978 and Wild Green Vegetables of Canada, Turner, N.J. and Szczawinski, A.F. National Museum of Natural Sciences, Ottawa, 1980.

Appendix E

Wild Fruits – Use and Precautions Regarding Their Use*

FRUIT	USE	PRECAUTIONS
Bakeapples (cloudberries)	fresh, stored in water; jam	
Blackberries	fresh, mashed and dried in cakes, or dried whole, jams; jellies	
Blueberries	raw, dried individually or in cakes; mixed with meat or fat for pemmican	
Chokecherry	dried and used in pemmican, or eaten with salmon or salmon eggs; tea	
Crabapples	raw or cooked, mixed with other fruits and animal fat or ooligan grease	toxic reactions may result if eaten large amounts. Seeds contain a cyanogenic glucoside.
Cranberry (high bush, bog, low bush)	sauce or dried; preserved in oil or water; or mixed with ooligan grease and stored; whipped; jams, jellies	
Currants	eaten with oil, fish eggs, meat or other fruits, or dried; jellies	
Elderberries	cooked into a sauce and dried in cakes; jelly	
Gooseberries	raw or dried; mixed with other fruit or roots and dried; sauce; jelly	
Hawthorns	mashed, dried into cakes; jelly	can be toxic if consumed in large quantity; contain a glycoside with digitalis-like properties
Raspberry	fresh or boiled and dried; eaten with oil	
Rose Hips	outside pulp eaten raw; syrup	hairs from seeds irritate the digestive tract
Saskatoons	fresh, dried, used in pemmican, cooked with bulbs and roots and with deer or bear grease in soups and stews; used as a sweetener; jelly	
Soapberries	whipped and sweetened with other fruit to make "Indian Ice Cream"	
Strawberries	fresh; dried; jams	
Sumac	fruit; beverage	high in tannin. Use in moderation, avoid prolonged boiling

* Adapted from: Edible Wild Fruits and Nuts of Canada. Turner, N.J. and Szczawinski, A.F. National Museum of Natural Sciences, Ottawa, 1979.

Appendix F

Seeds and Nuts – Use and Precautions Regarding their Use*

	USE	PRECAUTIONS
Acorns	leached to remove tannin; sweet acorns ground into a meal, dried, used in baking	bitter acorns (red oak) are very high in tannin; must be leached
Hazelnuts	cakes; soup; pemmican (mixed with berries, bulbs, animal fat)	
Sunflower Seeds	meal used in soup; meal mixed with cornmeal to form cakes; source of oil	
White Bark Pine Seeds	roasted, combined with berries; pounded into flour	
Yellow Pond Lily Seeds	parched in hot frying pan until they pop open slightly then eaten as is, or pounded into a meal and used to make bread, porridge or to thicken soup	

*Adapted from: Edible Wild Fruits and Nuts of Canada. Turner, N.J. and Szczawinski, A.F. National Museum of Natural Sciences, Ottawa, 1979.

Table X.1 Summary Examples of Recommended Nutrient Intakes for Canadians[a,b]

				Fat-Soluble Vitamins			Water Soluble Vitamins			Minerals				
Age	Sex	Weight (kg)	Protein (g/day)[c]	Vitamin A (RE/day)[d]	Vitamin D (μg/day)[e]	Vitamin E (mg/day)[f]	Vitamin C (mg/day)	Folacin (μg/day)[g]	Vitamin B_{12} (μg/day)	Calcium (mg/day)	Magnesium (mg/day)[h]	Iron (mg/day)[i]	Iodine (μg/day)	Zinc (mg/day)[j]
Months														
0-2	Both	4.5	11[k]	400	10	3	20	50	0.3	350	30	0.4	25	2
3-5	Both	7.0	14[k]	400	10	3	20	50	0.3	350	40	5	35	3
6-8	Both	8.5	17[k]	400	10	3	20	50	0.3	400	50	7	40	3
9-11	Both	9.5	18	400	10	3	20	55	0.3	400	50	7	45	3
Years														
1	Both	11	19	400	10	3	20	65	0.3	500	55	6	55	4
2-3	Both	14	22	400	5	4	20	80	0.4	500	70	6	65	4
4-6	Both	18	26	500	5	5	25	90	0.5	600	90	6	85	5
7-9	M	25	30	700	2.5	7	35	125	0.8	700	110	7	110	6
	F	25	30	700	2.5	6	30	125	0.8	700	110	7	95	6
10-12	M	34	38	800	2.5	8	40	170	1.0	900	150	10	125	7
	F	36	40	800	2.5	7	40	180	1.0	1000	160	10	110	7
13-15	M	50	50	900	2.5	9	50	150	1.5	1100	210	12	160	9
	F	48	42	800	2.5	7	45	145	1.5	800	200	13	160	8
16-18	M	62	55	1000	2.5	10	55	185	1.9	900	250	10	160	9
	F	53	43	800	2.5	7	45	160	1.9	700	215	14	160	8
19-24	M	71	58	1000	2.5	10	60	210	2.0	800	240	8	160	9
	F	58	43	800	2.5	7	45	175	2.0	700	200	14	160	8
25-49	M	74	61	1000	2.5	9	60	220	2.0	800	250	8	160	9
	F	59	44	800	2.5	6	45	175	2.0	700	200	14[l]	160	8
50-74	M	73	60	1000	2.5	7	60	220	2.0	800	250	8	160	9
	F	63	47	800	2.5	6	45	190	2.0	800	210	7	160	8
75 +	M	69	57	1000	2.5	6	60	205	2.0	800	230	8	160	9
	F	64	47	800	2.5	5	45	190	2.0	800	220	7	160	8
Pregnancy (additional)														
1st Trimester			15	100	2.5	2	0	305	1.0	500	15	0	25	0
2nd Trimester			20	100	2.5	2	20	305	1.0	500	20	0	25	1
3rd Trimester			25	100	2.5	2	20	305	1.0	500	25	0	25	2
Lactation (additional)			20	400	2.5	3	30	120	0.5	500	80	0	50	6

Footnotes to Table X.1

[a] Recommended intakes of energy and of certain nutrients are not listed in this table because of the nature of the variables upon which they are based. The figures for energy are estimates of average requirements for expected patterns of activity (see Table II.1). For nutrients not shown, the following amounts are recommended: thiamin, 0.4 mg/1000 kcal (0.48 mg/5000 kJ); riboflavin, 0.5 mg/1000 kcal (0.6 mg/5000 kJ); niacin, 7.2 NE/1000 kcal (8 e NE/5000kJ); vitamin B_6, 15 μg, as pyridoxine, per gram of protein; phosphorus, same as calcium.

[b] Recommended intakes during periods of growth are taken as appropriate for individuals representative of the mid-point in each age group. All recommended intakes are designed to cover individual variations in essentially all of a healthy population subsisting upon a variety of common foods available in Canada.

[c] The primary units are expressed per kilogram of body weight. The figures shown here are only examples. See text.

[d] One retinol equivalent (RE) corresponds to the biological activity of 1 μg of retinol, 6 μg of β carotene or 12 μg of other carotenes.

[e] Expressed as cholecalciferol or ergocalciferol.

[f] Expressed as d α tocopherol equivalents, relative to which β- and γ- tocopherol and α- tocotrienol have activities of 0.5, 0.1 and 0.3, respectively.

[g] Expressed as total folate.

[h] Assumption that the protein is from breast milk or is of the same biological value as that of breast milk and that between 3 and 9 months adjustment for the quality of the protein is made.

[i] It is assumed that breast milk is the source of iron up to 2 months of age.

[j] Based on the assumption that breast milk is the source of zinc for the first 2 months.

[k] After the menopause the recommended intake is 7 mg/day.

Appendix H

Recommended Recipe Books

Assiniwi, B., "**Indian Recipes**", Copp Clark Pub. Co., Toronto, 1972.

Assiniwi, B., "**Survival in the Bush**", Copp Clark Pub. Co., Toronto, 1972.

"**Choice Cooking**", Canadian Diabetes Association, N.C. Press, 1982.

Dunn, J., "**Indigenous North American Wild and Cultivated Plant Foods**", National Indian Brotherhood, Ottawa, 1977.

Ellis, E.A., "**Northern Cookbook**", Ed., Indian Affairs and Northern Development, Ottawa, 1977 (out of print).

"**Indian Food – A Cookbook of Native Foods from British Columbia**", Medical Services, Pacific Region, Health and Welfare Canada, 1971.

"**Native Women's Picture Cook Book**", Native Women's Association of the N.W.T., 1983.

Szczawinski, A.F. and Turner, N.J., "**Edible Garden Weeds of Canada**", National Museum of Natural Sciences, Ottawa, 1978. Reprinted 1980.

Turner, N.J. and Szczawinski, A.F., "**Edible Wild Fruits and Nuts of Canada**", National Museum of Natural Sciences, Ottawa, 1979. Reprinted 1980.

"**Wealth in Health**", The Consumer's Association of Canada, Whitehorse Branch.

"**Wilderness Kingdom New Cookbook**", Prairie Crafts, Saskatoon, Sask., 1972.

Appendix I

Additional Nutrition Information Available From Federal Government Departments

A. Health & Welfare Canada

1. Medical Services Branch

Nutrition Newsletter
Snacking Pamphlet
Nutrient Bar Graphs: A teaching aid to learn the value of native foods.

2. Health Services and Promotion Branch

Canada's Food Guide Handbook, revised 1982.
Nutrient Value of Some Common Foods 1979.
Nutrition Recommendations for Canadians. 1980.
Canada's Food Guide Tearsheet 1981.
Be a Wise Loser 1982.
Eat Better, Feel Great 1982.
Let's Talk About Nutrition 1981.
Using Canada's Food Guide to Eat Better and Feel Great 1982.

3. Health Protection Branch

Food Additives, Dispatch No. 30, 1982.
Food and Drug Interaction, Dispatch No. 50, 1982.
Food Additive Pocket Dictionary, 1982.
Guide to Food Additives, 1977.
The Addition of Nutrients to Foods. Dispatch No. 49, 1980.
Natural Toxicants in Plants. Tearsheet, 1984.
Food Safety. It's All In Your Hands
The Cost of Food Poisoning. Tearsheet, 1984
Microbial Food Poisoning. Dispatch No. 32, 1982
Infant Feeding. Dispatch No 46 (rev), 1984

B. Agriculture Canada, Ottawa:

Beans, Peas and Lentils. Pub. 1555
Fresh Canadian Vegetables. Pub. 1476
Canning Meat at Home. Factsheet
Making Dairy Products at Home. Pub. 1759
Jams, Jellies and Other Preserves. Pub. 1753
Freezing Foods. Pub. 892

Appendix J

Some Recommended Food and Nutrition Publications and Teaching Aids

Alton Mackey, Mary G. **An Evaluation of Household Country Food Use.** Black Tickle, Labrador, July 1980 – June 1981, Extension Service and Faculty of Medicine, Memorial University of Newfoundland, 1984.

Alton Mackey, Mary G. **An Evaluation of Household Country Food Use.** Makkovik, Labrador., July 1980 – June 1981, Extension Service and Faculty of Medicine, Memorial University of Newfoundland, 1984.

Back to School with Breakfast. A resource kit for elementary schools. Labrador Institute of Northern Studies, Memorial University of Newfoundland, 1983.

B.C. Native Food Guide. Coastal. Medical Services Branch, Pacific Region, Health and Welfare Canada, 1984.

B.C. Native Food Guide. Interior. Medical Services Branch, Pacific Region, Health and Welfare Canada, 1984.

Bomberry, Alice. **Woodland Indian Agriculture.** Woodland Indian Cultural Educational Centre, Brantford, Ont., 1982.

Bomberry, Alice. **Woodland Indian Foods.** Woodland Indian Cultural Educational Centre. Brantford, Ont., 1984.

Canning Guide for Meat, fish, poultry, fruits, vegetables, jams, jellies pickles. Dept. of RAND, Regional Development Division, St. John's, Nfld.

Choose Nutrition Now . . . It Pays. Training Manual. Labrador Institute of Northern Studies. Memorial University of Newfoundland. 1983.

Clarran, S.K., **Recognition of Fetal Alcohol Syndrome.** J.A.M.A. 245. 2436-39, June 1981.

Cooking with Egg Powder. Breakfast Recipes Labrador Institute of Northern Studies, Memorial University of Newfoundland, 1983.

Deutsch, R.M. **The New Nuts Among the Berries.** Revised Bull Publishing Co. Palo Alto, California, 1977.

Diabetic Resource Kit. Battleford Indian Health Center.

Feeding Babies in the 80's. Health and Welfare Canada, (in press 1984).

Food and Health. Training Manual. Labrador Institute of Northern Studies, Memorial University of Newfoundland, 1983.

Food Plants of British Columbia Indians/Coastal People. Vol. 1, British Columbia Provincial Museum, Victoria, 1975-1978.

Food Plants of British Columbia Indians/Interior People. Vol. 2, British Columbia Provincial Museum, Victoria, 1975-1978.

For Baby's Sake Don't Drink. Yukon Alcohol and Drug Services, 1982.

Fremes, R., and Sabry Z. **Nutriscore.** Metheun Publishers, Toronto, 1982.

Good Food For Your Family. (Leaflet). Manitoba Department of Health, Home Economics Directorate. 1980.

Guidelines for Effective Native Nutrition Education. Manitoba Home Economics Directorate, March 1983.

Henry, Reg.: Primary Cayuga, **Conversational Communication at Mealtime**. Woodland Indian Cultural Education Centre, Brantford, Ont., 1976.

Henry, Reg., Primary Mohawk. **Conversational Communication at Mealtime**. Woodland Indian Cultural Educational Centre, Brantford, Ont., 1983.

Henry, Reg., **Food Utensils Flashcards**. Woodland Indian Cultural – Educational Centre, Brantford, Ont., 1983.

Henry, Reg., Colouring Book. **Cayuga Language at Mealtime**. Woodland Indian Cultural – Educational Centre, Brantford, Ont., 1977.

Herbert, V. **Nutrition Cultism, Facts, and Fictions**. Geo F. Stickley, Philadelphia, 1980.

Hutchens, Alma R. **Indian Herbiology of North America**. 9th ed. Merco, Windsor, Ontario, 1983.

Infant Nutrition Guidelines. Medical Services, Northwest Territories Region. 1979.

Lambert-Lagacé, Louise, **Feeding your child**. General Publishing, Co. Ltd., 30 Lesmill Road, Don Mills, Ontario, M3B 2T6, 1982.

Lappé, F.M. **Diet for a Small Planet**. Ballantyne Books, New York, 1975.

Le Riche, W.H. **The Complete Family Book of Nutrition and Meal Planning**. Methuen Publishers, Toronto, 1980.

Lillien, L.J., Huber, A.M. and Rajala, M.M. **Diet and Ethanol Intake in Pregnancy**. J.A.M.A. 81: 252-257, September 1982.

Macauly T., Gallant C.J., Hooper S.N. and Chandler R.F. **Caffeine content of Herbal and Fast Food Beverages**. J.C.D.A. 45(No. 2): 150-156, April 1984.

Manniup Pautangani Atutluni Ikatausut. **Ikatausimatuinatut**. Leaflet. Nutrition Education Project, Labrador Institute of Northern Studies, 1983.

My Body My Self. Training Manual for Weight Control Programs. Medical Services Branch, Pacific Region, 1984.

Nutrition and Dental Health. Classroom Activities for Kindergarten to Grade Seven, Medical Services Branch, Pacific Region, Health and Welfare Canada, 1984.

Nutrition Bingo with Native Foods. Medical Services Branch, Pacific Region, Health and Welfare Canada, 1984.

Nutrition Videotapes. Northwest Territories Region.

Nuxalk Food and Nutrition Handbook.
Produced by: The Nuxalk Food and Nutrition Program; Division of Human Nutrition, University of British Columbia and the Nuxalk Health Centre, P.O. Box 93, Bella Coola, B.C., 1984.

Ojibway Cree Food Guide. Treaty Nine, Thunder Bay, Ontario, 1982.

Ontario Dietetic Association, **The Nuts and Bolts of Nutrition**. Hospital Association Dietetic Services. Don Mills, Ontario, 1980.

Recommended Nutrient Intakes for Canadians. Health Protection Branch, Health and Welfare Canada, 1983.

Ritchie, Jean, A.S. **Learning Better Nutrition**. Food and Agriculture Organization of the United Nations, Rome, Italy, 1967.

Robertson, E.C. **The Right Combination – A Guide to Food and Nutrition**. Gage Educational Publishers, Toronto, 1978.

Robertson, L., Flinders C., and Godfrey B. **Laurel's Kitchen: A Handbook for Vegetarian Cookery and Nutrition**. Nilgiri Press, California, Berkley, 1976.

School Food Program Manual for Labrador. Labrador Institute of Northern Studies, Memorial University of Newfoundland, 1982.

School of Dental Therapy Training Manual. Projects 24, 72 and 21. National School of Dental Therapy, Medical Services Branch, Prince Albert, Sask.

Smith, E. **Vegetarian Meal Planning Guide**. Hyperion Press, Winnipeg, 1979.

Snacks, Snacks, Snacks. (leaflet) Health and Welfare Canada, Medical Services Branch (Manitoba) 1982.

Szczawinski, A.F. and Turner, N.J. **Edible Garden Weeds of Canada**. National Museum of Natural Sciences, Ottawa, 1978, reprinted 1980.

Szczawinski, A.F. and Turner, N.J. **Wild Green Vegetables of Canada**. National Museum of Natural Sciences, Ottawa, 1980.

Tektitetsiutemik Pullaujanik Attudlune. **Directions for Using a Pressure Canner**. Labrador Institute of Northern Studies, Memorial University of Newfoundland, 1982.

Turner, N.J. and Szczawinski, A.F. **Edible Wild Fruit and Nuts of Canada**. National Museum of Natural Sciences, Ottawa, 1979, reprinted 1981.

Weight Control Training Manual. Atlantic Region.

Appendix K

Nutrient Values of Selected Foods Commonly Used by Indian and Inuit

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FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
A. MEAT, GAME, BIRDS AND EGGS, ORGANS, RELATED PRODUCTS														
Meat														
1. Bear, Black, stewed		90	(123)	(513)	(3)	0	(23)	(18)	(2.2)	0	(.06)	(.62)	(8.0)	(2)
2. Bear, Polar, stewed		90	(123)	(513)	(3)	0	(23)	(14)	0	0	.00	(11.70)	(5.1)	(4)
3. Beaver, cooked		90	223	933	12	0	26	19	1.3	0	.07	.34	15.0	0
4. Beef (Stewing) cooked		90	197	825	9	0	27	12	3.4	5	.05	.21	8.7	0
5. Bologna		90	283	1187	27	tr	13	13	1.3	0	13	13	4.1	20
6. Caribou, cooked		90	157	655	1	0	34	17	3.1	6	10	.57	10.4	0
7. Caribou, dried		90	(410)	(1715)	(27)	0	(38)	(21)	(5.0)	0	(1.00)	(1.00)	(18.0)	0
8. Deer, fresh, roasted		90	181	757	5	0	27	8	2.0	0	.01	.21	9.0	0
9. Ground Squirrel, (Richardson), cooked		90	194	812	9	0	26	19	1.3	0	.05	.06	15.3	0
10. Groundhog, cooked		90	194	812	9	0	26	19	1.0	0	.04	.06	12.5	0
11. Moose, cooked		90	158	661	3	0	31	9	3.0	47	.05	.29	10.0	0
12. Muskrat, cooked		90	131	550	3	0	24	19	1.4	27	.4	19	14.9	0
13. Pork Chops, cooked (fat & lean)		90	351	1468	28	0	22	11	3.1	0	.85	.25	9.8	0
14. Pork Sausages, cooked		90	333	1390	27	tr	18	27	1.3	0	.67	.22	6.3	tr
15. Rabbit Hare, Wild, stewed		90	194	812	9	0	26	19	1.4	0	.05	.06	15.3	0
16. Seal, cooked		90	165	690	8	0	23	23	19.0	-	13	.63	-	tr
17. Seal, raw		90	130	546	5	0	25	17	17.9	117	.10	.40	10.4	2
18. Walrus, cooked		90	(189)	(782)	(9)	0	(23)	(16)	(4.0)	(50)	(.10)	(.36)	(9.0)	0
19. Weiners, heated		90	268	1205	27	1	11	11	1.1	0	18	11	3.6	23

Note: Numbers in parentheses ( ) indicate imputed values. Dashes denote lack of reliable data for a constituent believed to be present in a measureable amount.

FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
Birds and Eggs														
20. Chicken, roast, meat only		90	171	716	7	0	26	14	1.1	14	.06	.16	13.3	0
21. Duck, wild, raw, flesh only		90	112	469	1	0	19	17	3.0	–	.14	.27	6.3	0
22. Egg, whole, chicken	1 egg	50	79	330	6	tr	6	28	1.0	78	.04	.15	1.6	0
23. Eggs, wild Duck	1 egg	50	(72)	(301)	(5)	tr	(6)	(34)	(2.0)	(44)	(.06)	(.38)	(2.0)	0
24. Goose, wild, roasted		90	278	1164	18	0	27	20	2.3	263	.08	.26	14.6	0
25. Pheasant, cooked		90	187	783	6	0	31	15	1.6	266	.06	.16	12.7	0
26. Ptarmiga, raw		90	104	435	1	0	23	316	–	tr	.04	2.10	–	6
27. Turkey, roast, meat only		90	153	640	4	0	26	23	1.6	0	.06	.16	9.9	0
Organs, Related Products														
28. Animal Blood, coagulated, raw		90	83	347	tr	tr	19	1	40.0	0	.01	.09	4.0	0
29. Caribou Bone Marrow, raw	15 mL	13.5	105	440	11	0	1	–	1.0	10	.01	.03	.2	–
30. Heart, (Beef), braised		90	169	708	5	tr	28	5	5.3	8	.28	1.10	13.1	tr
31. Intestines, cooked		90	275	1148	26	0	8	24	3.0	0	.00	.07	3.5	0
32. Kidney, (Beef), cooked		90	227	949	11	tr	30	16	11.8	311	.40	4.34	16.9	0
33. Liver, (Beef), fried		90	205	859	9	4	24	10	7.9	14,418	.24	3.76	20.5	24
34. Liver, (Chicken) simmered		90	141	590	5	tr	22	13	7.6	4422	.14	1.57	9.1	14
35. Liver (Deer), cooked		90	206	862	10	5	24	10	8.0	14,432	.23	4.00	12.00	24
36. Liver (Goose), raw		90	120	501	3.8	6	15	39	27.5	8556	.51	.80	9.3	4
37. Liver, (Seal), raw		90	103	433	3	–	16	11	12.0	9981	.16	2.72	.8	–
38. Muktuk		90	709	2966	77	1	2	14	–	74	21	–	–	1
39. Stomach Contents, Caribou		90	80	335	1	11	4	42	5.0	306	.01	.26	2.6	–
40. Tongue, (Beef), braised		90	220	919	15	tr	19	6	2.0	0	.05	.26	7.0	0

Note: Numbers in parentheses ( ) indicate imputed values. Dashes denote lack of reliable data for a constituent believed to be present in a measureable amount.

FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
B. FISH, SEAFOOD, RELATED PRODUCTS														
Fish														
41. Arctic Char, raw		90	131	550	5	0	21	36	2.0	–	.11	.48	6.8	1
42. Cod, dried, salted		90	117	490	tr	0	26	203	3.2	0	.07	.41	15.0	0
43. Cod, fresh, broiled		90	153	640	5	0	26	28	.9	49	.07	.09	9.5	0
44. Eel, (Anguilla Rostata), raw		90	210	879	16	0	14	16	.6	435	.19	.32	2.0	–
45. Fish Head Soup (Fish Chowder)	150	–	182	783	6	11	22	142	.7	55	.12	.26	6.7	0
46. Flounder (or Sole), raw		90	71	298	tr	0	15	11	.7	0	.04	.05	3.9	0
47. Haddock, pan fried		90	131	550	6	0	19	24	.7	16	.04	.07	6.5	0
48. Herring, broiled or baked		90	217	907	14	tr	21	25	1.3	47	.01	.16	8.0	3
49. Lake Trout, broiled or baked		90	194	812	13	tr	21	45	4.5	86	.11	.24	5.2	3
50. Mackerel, Atlantic, raw		90	171	715	11	0	17	5	1.0	(122)	.15	.33	7.9	–
51. Mackerel, Atlantic, broiled with butter		90	212	887	14	0	19	6	1.2	(144)	.15	.27	7.3	0
52. Ooligan (Eulachon), raw		90	106	444	5	0	13	45	.8	45	.03	.03	.2	1
53. Ooligan (Eulachon), Bella Coola, smoked, dried		90	277	1158	22.3	tr	18	27	10.9	–	.05	.88	–	0
54. Pickerel, raw		90	84	351	1	0	17	12	.3	119	.23	.14	5.0	0
55. Pike, steamed		90	89	372	tr	0	20	14	.4	119	.23	.18	5.4	0
56. Red Snapper, raw		90	84	350	tr	0	18	14	.7	0	.15	.01	4.2	0
57. Salmon, Atlantic, broiled or baked		90	164	686	7	0	24	0	1.1	44	.14	.05	13.1	0
58. Salmon, Coho, Bella Coola, dried		90	251	1050	3	0	56	tr	–	–	–	–	–	–
59. Salmon, Coho, canned, (solids and liquids)		90	138	576	6	0	19	220	.8	22	.02	.17	7.0	0
60. Salmon, King (Chinook), canned, (solids and liquids)		90	189	789	13	0	18	139	.8	62	.02	.13	10.0	0

Note: Numbers in parentheses ( ) indicate imputed values. Dashes denote lack of reliable data for a constituent believed to be present in a measureable amount.

FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
B. FISH, SEAFOOD, RELATED PRODUCTS														
Fish (cont'd)														
61. Salmon, Sockeye, canned (solids and liquids)		90	154	644	8	0	18	233	1.0	62	.03	.14	7.0	–
62. Salmon, smoked		90	158	662	8	0	19	13	1.3	8	.18	.25	3.9	–
63. Smelts, broiled		90	90	377	1	0	18	7	.7	0	.01	.11	5.3	0
64. Whitefish, broiled		90	176	738	10	tr	21	28	1.0	96	.11	.05	6.4	0
65. Whitefish, smoked		90	139	584	7	0	19	20	.4	54	.14	.12	6.7	0
Seafood														
66. Abalone, canned		90	72	302	tr	2	14	13	2.1	27	.11	.13	2.7	0
67. Abalone, raw		90	88	369	tr	3	17	33	2.0	27	.16	.13	4.0	0
68. Black Sea Prunes		90	75	314	tr	3	11	48	19.0	–	–	.09	.8	–
69. Clams, raw, meat and liquid		90	44	184	tr	4	6	62	7.0	27	.09	.11	2.0	9
70. Crab, fresh, steamed (incl. Blue, Dungeness Rock and King)		90	84	351	1	tr	16	39	.7	586	.14	.07	2.9	1
71. Mussels, cooked		90	142	595	8	3	15	94	3.6	116	.13	.19	.1	0
72. Octopus, raw		90	66	275	7	0	14	26	.6	0	.01	.05	4.0	0
73. Oysters, Eastern, raw		90	60	251	3	3	9	84	5.0	84	.12	.15	3.3	27
74. Oysters, Pacific, raw		90	81	342	1	5	9	76	6.5	83	.11	.16	2.6	27
75. Shrimp, raw		90	81	342	tr	1	16	57	1.4	0	.01	.03	5.7	0
Related Products														
76. Fish Eggs, (Carp, Cod, Haddock, Herring, Pike, Shad), cooked		90	113	474	2	1	19	11	2.1	0	.09	.68	5.7	0
77. Fish Eggs, (Carp, Cod, Haddock, Herring, Pike, Shad), raw		90	117	490	2	1	22	27	.5	0	.09	.68	7.5	13

Note: Numbers in parentheses ( ) indicate imputed values. Dashes denote lack of reliable data for a constituent believed to be present in a measureable amount.

FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
Related Products (cont'd)														
78. Fish Eggs, (Salmon, Sturgeon, Turbot), cooked		90	(180)	(756)	(11)	(2)	(20)	(5)	(.5)	0	(.34)	(.65)	(6.0)	0
79. Herring Eggs on Kelp, dried		90	232	971	2	8	45	238	11.7	1	.85	.29	2.1	3
80. Sea Urchin Eggs, raw		90	133	556	7	1	14	18	1.8	810	.27	.36	2.2	0
81. Liver, (King Salmon)		90	140	586	7	3	15	25	–	857	.09	.63	–	11
82. Liver, (Whitefish)		90	94	393	3	4	9	49	–	2264	.01	.85	–	7
C. MATURE DRY BEANS AND PEAS, NUTS AND SEEDS														
83. Dry Beans, Common White, cooked, drained	250	190	224	936	1	40	15	95	5.1	0	.27	.13	3.8	0
84. Dry Peas, Split, cooked	250	211	243	1015	tr	44	17	23	3.6	8	.32	.19	4.9	0
85. Peanut Butter	15	17	99	413	8	3	5	11	.3	0	.02	.02	3.6	0
86. Seeds, Pumpkin, Squash, dry	125	74	409	1712	35	11	21	38	8.3	5	.18	.14	8.3	0
87. Seeds, Sunflower, dry	125	77	431	1804	36	15	18	92	5.5	4	1.51	.18	8.5	0
88. Beans: sprouts, alfalfa, raw	250	132	54	226	tr	7	7	37	1.8	11	.19	.28	2.1	21
D. VEGETABLES														
89. Broccoli, cooked	1 med. stalk	180	45	190	1	8	6	158	1.4	450	.16	.36	1.4	162
90. Cabbage, raw, shredded	250	148	23	95	tr	5	1	47	.4	12	.05	.05	.4	45
91. Cabbage, cooked, shredded	125	76	15	64	tr	3	1	33	.2	10	.03	.03	.2	25
92. Carrots, raw	125	58	25	105	tr	6	tr	22	.4	638	.04	.03	.4	5
93. Celery, raw	125	53	9	37	tr	2	tr	21	.1	12	.01	.01	.2	5
94. Dandelion Greens, cooked	125	53	17	71	tr	3	1	74	.9	620	.07	.08	0	9
95. Dandelion Greens, raw	250	58	15	63	tr	5	1	109	1.8	812	.11	.15	0	20
96. Dock (Rumex sp), cooked (incl. curly, broad leaf, dock and sheep sorrel)	125	95	18	75	tr	3	1	52	.9	1026	.05	.12	.3	51

Note: Numbers in parentheses ( ) indicate imputed values. Dashes denote lack of reliable data for a constituent believed to be present in a measureable amount.

FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
D. VEGETABLES (cont'd)														
97. Dock (Rumex sp), raw	250	133	37	155	tr	7	3	87	2.1	1715	.11	.29	.7	158
98. Fiddlehead Greens (Matteucia Struthiopteris), frozen, cooked	125	82	17	71	tr	3	2	4	.7	15	.10	.05	.8	13
99. Fireweed (Epilobium Latifolium) young leaves, raw	250	58	29	121	tr	4	2	8	1.0	332	.02	.49	1.0	57
100. Lamb's Quarters (Chenopodium Album), (Pigweed), cooked	125	82	26	109	tr	4	3	211	.5	795	.08	.21	.7	30
101. Lamb's Quarters (Chenopodium Album), raw	250	164	70	295	1	11	7	507	1.9	1902	.26	.72	1.9	131
102. Lichen, Black (Alectoria sp)		100	–	–	–	–	–	48	8.3	–	.03	.11	–	9
103. Peas, canned drained	125	90	79	331	tr	15	4	23	1.7	62	.08	.05	1.2	7
104. Potatoes, baked in skin	1 each	135	126	525	tr	28	4	12	.9	0	.13	06	2.3	27
105. Potatoes, boiled in skin	1 each	152	116	483	tr	26	3	11	.9	0	.14	.06	2.3	24
106. Potatoes, boiled, peeled	1 each	150	98	410	tr	22	3	9	.8	0	.14	.05	1.8	24
107. Potatoes, french fried	10 each	57	156	653	8	21	2	9	.7	0	.07	.05	1.8	12
108. Purslane (Portulaca oleracea sp), cooked	125	57	8	35	tr	1	1	49	.7	119	.01	.03	.23	7
109. Purslane (Portulaca oleracea sp), raw	250	143	30	125	tr	5	2	147	5.0	357	.04	.14	.7	35
110. Seaweed, (Macrocystis Integrifolia), (Kelp), dried		100	–	–	–	–	11	650	9.3	–	–	–	–	–
111. Seaweed, (Porphyra sp..) (Laver), dried		100	300	1255	1	44	28	169	10.5	2634	.37	1.79	6.7	11
112. Seaweed (Dulse), blanched		100	10	42	tr	2	tr	67	1.1	27	.01	.02	.0	0
113. Tomatoes, canned, (solids and liquids)	125	127	27	113	tr	5	1	7	.7	115	.07	.04	.9	22
114. Tomato, raw	1 med.	150	33	138	tr	7	2	20	.8	135	.09	.06	1.2	35
115. Turnip, cooked	125	90	32	134	tr	8	1	53	.2	50	.06	.06	.7	24

Note: Numbers in parentheses ( ) indicate imputed values. Dashes denote lack of reliable data for a constituent believed to be present in a measureable amount.

FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
E. FRUIT														
116. Apple Juice, vitaminized	125	131	61	257	0	15	tr	8	.8	0	.01	.02	.1	48
117. Apples, raw	1 each	154	89	374	tr	22	tr	11	.5	14	.05	.03	.2	6
118. Apples, dried, uncooked	–	100	275	1151	1	71	1	31	1.6	0	.06	.12	.5	10
119. Apples, dried, cooked without added sugar	–	100	78	326	tr	20	tr	9	.5	0	.01	.03	.1	tr
120. Bakeapple, (Rubus chamaemorus) (Cloudberry), raw	125	100	51	213	tr	8.6	2	18	.7	21	.05	.07	.9	58
121. Blackberries, raw	125	76	44	184	tr	10	1	24	.7	15	.02	.03	.3	16
122. Blueberries, raw	125	77	48	201	tr	12	tr	12	1	8	.03	.05	.4	11
123. Cherries, raw, sweet	125	62	43	181	tr	11	1	13	.2	7	.03	.03	.2	6
124. Crabapples, raw	125	100	68	285	tr	17	tr	6	.3	4	.03	.02	.1	8
125. Cranberries (Vaccinium Macrocarpon, (bog)), raw	125	48	22	92	tr	5	tr	7	.3	2	.01	.01	tr	6
126. Cranberries (Vaccinium Vibernum) (High Bush), raw	125	50	–	–	–	–	–	–	–	105	–	–	–	50
127. Cranberries (Vaccinium Vitus (Low Bush)), raw	125	50	–	–	–	–	–	–	–	–	–	–	–	10
128. Currants, Black, (Ribes sp.), raw	125	50	27	113	tr	6	tr	30	.5	16	.02	.02	.1	100
129. Currants, Red/White (Ribes sp.), raw	125	50	25	105	tr	6	tr	16	.5	6	.02	.03	.05	21
130. Elderberries, (Sambucus sp), raw	125	50	36	150	tr	8	1	17	.8	30	.03	.03	.2	18
131. Gooseberries (Ribes sp.), raw	125	50	20	84	tr	5	tr	9	.3	15	.05	.04	2.8	33
132. Huckleberries (Vaccinium parvifolium)	125	50	23	96	tr	3	tr	11	.2	–	.01	.06	–	1
133. Peaches, (canned), heavy syrup	125	50	106	442	tr	27	tr	5	.4	59	.01	.03	.8	4
134. Peaches, raw, whole, pared	1 each	95	36	151	tr	9	tr	9	.5	126	.02	.05	1	7

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FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
E. FRUIT (cont'd)														
135. Prunes, (dried), cooked	125	112	134	560	tr	35	1	27	20	84	.04	.08	.8	1
136. Raisin, seedless, packed	125	87	251	1052	tr	67	2	54	3.0	1	.09	.07	.4	1
137. Rashberries, raw	125	65	37	155	tr	9	1	15	.9	9	.02	.06	.6	17
138. Rosehips, raw	–	100	–	–	–	–	–	–	–	–	–	–	–	165-615
139. Salmonberries (Rubus spectabilis), raw	125	50	29	58	tr	2	1	8	.2	25	tr	04	0	13
140. Strawberries, raw	125	79	29	121	tr	7	tr	17	.8	5	.03	.05	.5	47
F. BREAD, BANNOCK, CEREALS, RELATED PRODUCTS														
141. Bannock	1 serv.	37	142	594	2	26	4	44	1.0	0	.25	.13	2.0	0
142. Bread, white, enriched	1 sl.	30	81	339	tr	15	3	25	.8	0	.12	.07	1.1	0
143. Bread, whole wheat, 100%	1 sl.	30	73	305	tr	14	3	30	.9	0	.08	.04	1.4	0
144. Cornmeal, degermed, dry	125	73	266	1112	tr	57	6	4	.8	96	.10	.04	.7	0
145. Oatmeal Porridge	125	125	68	287	1	12	2	11	.7	0	.10	.02	.1	0
146. Macaroni, enriched, cooked	125	74	82	343	tr	17	2	6	1.1	0	11	18	2.8	0
147. Rice, long grain, converted, cooked	125	84	89	375	tr	19	2	16	.7	0	.09	.01	1.0	0
G. FATS AND OILS														
148. Butter	15	14	100	420	11	tr	tr	3	tr	106	tr	tr	tr	0
149. Goose Fat	15	13.3	120	502	13	0	0	0	.0	0	.00	.00	.0	0
150. Lard	15	13	117	491	13	0	0	tr	.0	0	.00	.00	.0	0
151. Margarine, WFA Declaration on Label	15	14	100	420	11	tr	tr	4	.0	148	tr	tr	tr	tr
152. Ooligan (Eulachon) Grease	15	13.3	126	527	13	0	0	9	tr	266	tr	tr	tr	0
153. Seal Fat	15	13.3	126	527	13	0	tr	1.5	–	95	.50	.05	.0	7

Note: Numbers in parentheses ( ) indicate imputed values. Dashes denote lack of reliable data for a constituent believed to be present in a measureable amount.

FOOD DESCRIPTION	MEASURE mL	WEIGHT g	ENERGY kcal	ENERGY kJ	FAT g	CARBOHYDRATE g	PROTEIN g	CALCIUM mg	IRON mg	VITAMIN A RE	THIAMIN mg	RIBOFLAVIN mg	NIACIN NE	VITAMIN C mg
H. MILK, MILK PRODUCTS														
154. Milk, dry, skim, (nonfat solids) instant, reconstituted	250	25	90	375	tr	13	9	308	tr	178	.10	.44	2.3	1
155. Milk, whole, cow's	250	257	158	661	9	12	8	307	.1	80	.10	.42	2.2	2
156. Milk, 2%	250	258	128	536	5	12	9	314	.1	147	.10	.43	2.2	2
157. Milk, evaporated, whole, canned	250	266	357	1496	20	27	18	694	.5	144	.13	.84	4.8	44
158. Milk, human	250	–	180	757	11	–	3	82	.1	165	.03	.09	.5	13
159. Cheese, cheddar, processed	–	45	169	707	14	tr	10	277	.2	131	.01	.16	2.5	0
160. Yoghurt, plain	–	125	79	331	2	9	7	228	.1	20	.06	.27	.8	1
I. SPREADS AND SYRUPS														
161. Honey	15	22	67	280	tr	18	tr	1	.1	0	tr	tr	tr	tr
162. Jams and Preserves	15	21	57	239	tr	15	tr	4	.2	tr	tr	tr	tr	tr
163. Jellies	15	19	52	217	tr	13	tr	4	.3	tr	tr	tr	tr	tr
164. Maple Syrup	15	21	50	210	0	13	0	33	.6	0	00	.00	.0	0
165. Molasses, light	15	20	50	210	–	13	–	33	.9	–	.01	.01	tr	–
J. BEVERAGES														
166. Alcohol, (Gin, Rum, Vodka, Whiskey)	50	48	111	464	0	0	0	0	.0	0	.00	.00	.0	0
167. Alcohol (Beer)	1 bttle	–	145	608	0	13	1	17	.0	0	.00	.10	2.1	0
168. Coffee, instant, infusion	250	254	3	11	0	0	0	5	.3	0	.00	tr	.8	0
169. Tea, instant, infusion	250	254	5	21	0	1	0	0	.0	0	.00	.03	.0	0
170. Cola	200	208	81	339	0	21	0	0	.0	0	.00	.00	.0	0

Note: Numbers in parentheses ( ) indicate imputed values. Dashes denote lack of reliable data for a constituent believed to be present in a measureable amount.

Appendix L

How to read the Nutrient Bar Graphs

Reading across the bottom line (horizontal axis) you will find listed energy (kilojoules)* and 10 essential nutrients each represented by a bar of a different colour.

The left hand side (vertical axis) of the graph gives the percentage from 0 to 33 of the Recommended Nutrient Intake (RNI) for a girl aged 13 to 15 years.

The height of each bar indicates the percentage contribution of each nutrient to the RNI. The numeral at the base of each bar gives the actual percentage contribution for each nutrient. If a food contributes more than 33% to the RNI, this is represented by a broken bar. Certain key nutrients are characteristic for certain groups of foods.

A more detailed explanation of the RNI and the Nutrient Bar Graph is presented in Part Three, Illustrated Reference Resource, Native Foods and Nutrition.

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* Kilojoule is the new metric term for energy (1 calorie = 4.184 kilojoules).